# E-COMMERCE ADOPTION BY SMALL AND MEDIUM SIZED ENTERPRISES IN INDONESIA: An Empirical Study of Influencing Factors and the Impact of E-Commerce Adoption on SME Performance

RITA RAHAYU

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**Abstract**

This study considers e-commerce adoption by SMEs in developing countries and, in particular, SMEs in Indonesia. It not only explores the extent of e-commerce adoption by SMEs in Indonesia and the determinant factors of e-commerce adoption but also the post-adoption benefits of e-commerce. It adds to the extant literature by considering both 'downstream' and 'upstream' factors within the context of developing countries. Many existing studies only consider upstream or downstream issues and in the context of developed countries. The focus is not on business organizations in general but SMEs in particular.

The significance of this study is due to the limited current studies regarding e-commerce adoption in SMEs that were conducted developing countries.

Eleven factors were identified as the determinant factors of e-commerce adoption and fifteen post adoption (upstream) benefits were identified. A combination of questionnaires and semi-structured interviews were used in the data collection. Three hundred and one questionnaires provided quantitative data which was analysed by using regression analysis and ANOVA. The twenty-two, semi-structured interviews provided qualitative data about the reasons why these SMEs adopted e-commerce and the actual benefits realised by them, and all of that gave useful support to the questionnaire results. Data collection was in late 2013 / early 2014.

This study found that six factors, namely perceived benefits, technology readiness, external support, manager/owners innovativeness, manager/owners IT experience and manager/owners IT ability, have a positive and significant correlation with e-commerce adoption. Then, extending market reach; increased sales; improved external communication; improved company image; improved speed of processing; and increased employee productivity were found as the top six e-commerce benefits perceived by the Indonesian SMEs. In addition to this, the adoption of e-commerce has a positive and significance impact on SMEs market performance and communication performance.

The findings have implications for the Indonesian government, IT vendors and the SME owners. The low level of e-commerce adoption by Indonesian SMEs certainly has an implication for the Indonesian government. The results of this study could help them to increase further, and better target, effective programmers to encourage the adoption of e-commerce by Indonesian SMEs.

For IT vendors, this condition would be an opportunity for them in promoting their products and services. In order to increase their success, they should also consider the determinant factors of e-commerce adoption. Many SME owners want to raise their level of adoption so that they can excel in competition

This thesis makes a contribution to theory and practice by providing for Indonesian SMEs in particular, and SMEs in developing countries in general, a holistic picture of e-commerce adoption; the extent of e-commerce adoption; and, the determinant factors leading to adoption and the post adoption benefits.

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**RESEARCHER NOTE**

Some parts of the work in this dissertation have been presented and published as research papers in international conferences and journals during 2012-2014.

The research papers presented in international conferences are:

1. "*E-commerce Adoption by Small and Medium Enterprises and Firm Performance*" that was presented in the 13th Malaysia-Indonesia International Conferences on Economics, Management and Accounting (MIICEMA) on 18-20 October 2012 at Palembang, Indonesia.
2. "*E-commerce Adoption by Small and Medium Sized Enterprises in Indonesia: an Investigation of Influencing Factors and Benefits"* that was presented in the 2nd AASIC, the International Conference on Business, Economic and Social Science (ICBESS) on 4-5 November 2013 at Bangkok, Thailand.
3. *"Determinant Factors of E-commerce Adoption by SMEs in Developing Countries: Evidence from Indonesia"* that was presented in Istanbul University World Conference on Technology, Innovation, and Enterpreneurship on 28-30 May 2015 at Istanbul, Turkey.
4. *"E-commerce Adoption by SMEs in Developing Countries: Evidence from Indonesia"* that was presented in the 16th Eurasia Business and Economic Society (EBES) conference on 26-28 May 2015 at Istanbul, Turkey.

The research paper published in international journals are:

1. Rahayu, R., Day, J. (2015). Determinant Factors of E-commerce Adoption by SMEs in Developing Country: Evidence from Indonesia. *Procedia -Social and Behavioral Science*, 195, 142-150.
2. Rahayu, R., Day, J. (2016). E-commerce adoption by SMEs in developing countries: evidence from Indonesia. Eurasian Business Review, pp.1-17. DOI 10.1007/s40821-016-0044-6

# CHAPTER 1: INTRODUCTION

## 1.0 INTRODUCTION

This chapter provides a general introduction to this research. This chapter starts by explaining about the background of this study in section 1.1, and it is followed by explaining about the significance of the study and the rationale of this study in section 1.2 and 1.3. The research objective and research question are outlined in section 1.4. Then a brief overview about Indonesia is in presented section 1.5, and then the scope of this study is in section 1.6. Finally, the structure of this thesis is described in section 1.7.

## 1.1 BACKGROUND OF THE STUDY

It is inevitable that in recent years e-commerce, which is one of the innovations of information technology, became very popular not only among academics but also among professionals. Its popularity is because of the four distinct characteristics of such innovation: the ability to access world-wide markets and information directly; an expediting to market; the ability to transform business processes; and a shift in the balance of power between supplier and customers as information becomes more widely available (Mike and Anthony, 2004).

E-commerce is not only changing the way business conducts selling activities, purchasing or dealing with customers or suppliers, but even further, e-commerce also changes the business perspective from “production excellence” to “customer intimacy” (Treacy and Wiersema, 1997 as cited by MacGregor, 2005), and from being “agent of seller” to being“ agent of buyer” (Achrol and Kotler, 1999). This condition of course brings major changes in the world economy, with a shift from a post-industrial era that was characterized by a physical goods focus to the knowledge economy era, in which service, information and intelligence are the main focus (Rayport and Jaworski, 2001).

In order to survive in this new economy, the business is forced to adopt this technology. Those who are not adopting e-commerce technology will be left

behind by those who adopt it. This is because, besides e-commerce providing a new way to sell, purchase, and deal with customers and suppliers, it also offers several benefits for business in terms of cost savings, time reduction, expanding a market, improved internal and external communications, and improved overall satisfaction (Molla and Licker, 2005a). These aspects make e-commerce the new business model that makes shopping more convenient and offersthe cheapest price, customised products and integrated offerings, something that traditional commerce cannot hope to compete against (Harpin, 2000).

Therefore, it is not surprising that e-commerce has become popular in the last few decades. This is seen by the increase of e-commerce use worldwide. Based on the IDC report (2011), in 2009, 624 million internet users had made online purchases with total revenue nearly $8 trillion (both businesses to business and business to consumer); and this number was predicted to be increased by year-end 2013 to more than $16 trillion of transactions. For B2C alone, according to the Statita in 2012, B2B transactions across the world were $1,058 trillion; and this number is expected to reach $1.92 trillion by the end of 2015. In Asia, the significant growth of e-commerce can also be seen. Based on data reported by The Internet World Statistics (2015), the number of internet users increased dramatically from 2000 to 2015. In June 2015, there were 1.56 billion people in Asia using the internet, whilst in 2000 the number of internet users was only 114 million.

However, the increase of e-commerce use by business is mostly being shown by large companies. In comparison to larger companies, e-commerce adoption by SMEs is considered relatively low (Govindaraju, Wiratmadja, and Rivana, 2015; Alam, Ali, and Jani, 2011; Chiliya, Chikandiwa, and Afolabi, 2011)

This certainly raises the question of what factors affect SMEs in adopting e-commerce. This question is at the heart of this study.

## 1.2 SIGNIFICANCE OF THE STUDY

As described previously, the adoption of e-commerce by SMEs is still lagging behind compared to larger companies. This rasies the question as to what are the factors that influence SMEs in their adoption of e-commerce. The answer to this question is needed, because as commonly known SMEs play an important role in economic development in almost all countries in the world. They make a significant contribution, not only in terms of their number but also in terms of provision of employment. They play an important role in the economic growth of a country through their ability to provide employment, create new jobs and create an income for people in the area. Empirical evidences have shown that the SMEs contribute a larger portion of job creation than larger business (Wit and Kok, 2014; Ayyagari, Demirguc-Kunt, and Maksimovic, 2011; Neumark, Wall, and Zhang, 2011), and they also have the highest sales growth and employment growth (Ayyagari et al., 2011). So, it is not surprising that Kotelnikov (2007) recognized them as a driver of economic growth and innovation. In developing countries, the roles of SMEs become more meaningful especially in terms of reducing poverty and unemployment. Because most SMEs are owned by local people and located in rural areas, the effect of SME growth brings direct benefit to very local areas(Kotelnikov, 2007). Therefore, the development of the SME will have a huge impact on world economic growth, and vice versa

These important roles of SMEs in economic development and the potential benefits of e-commerce technology emphasise why the study of e-commerce in SMEs, especially SMEs in developing countries, is needed. In this regard, Indonesia has been chosen asthe place in which to conduct this study.

One of the reasons to chose Indonesia is because it is one of the developing countries in Asia, and is a country with a large population - it is has the 4$^{th}$ largest population in the world (Kurnia, Choudrie, Mahbubur, and Alzougool, 2015). It is also recognized as the biggest archipelago country in the world, consisting of more than 17,000 islands. The position of Indonesia is in the heart of Southeast

Asia and neighbouring with Malaysia, Singapore, China, Japan, and Australia. Due to these conditions, recently Indonesia has been identified as one of countries that would be among the economic powers in this century, together with Mexico, Nigeria and Turkey, popularly known as "MINT" countries (Mexico, Indonesia, Nigeria, and Turkey). MINT was initially popularized by Jim O'Neil in 2013 as a companion to his BRIC countries (Brazil, Russia, India and China). As the country that has been recognized as an important player in the economic world, it would be interesting to study e-commerce adoption in this country.

Another reason is related to SMEs. Like any other country in the world, SMEs contribute 99% of the businesses in Indonesia. The large population and the vast territory actually can be a good reason for businesses in Indonesia to adopt e-commerce, especially for SMEs. However, as commonly found in most developing countries, the adoption of e-commerce by Indonesian SMEs is still lagging behind in comparison to the SME in developed countries (Kartiwi and MacGregor, 2008). This condition specifically encourages the author to conduct a study regarding the adoption of e-commerce by SMEs in Indonesia

## 1.3 E-COMMERCE STUDIES – THE RATIONALE

It cannot be denied that there have been many studies conducted in regard to e-commerce adoption by businesses. These studies were conducted not only in developed countries (Abebe, 2014; Sila, 2013; Duan, Deng, and Corbitt, 2012; Tiago and Maria, 2010; Chong, 2008; Al-Qirim, 2007; Wymer and Regan, 2005; Gibbs and Kraemer, 2004; Grandon and Pearson, 2004b; Raymond, 2001; Poon and Swatman, 1999) but also in developing countries (Kurnia, Karnali, and Rahim, 2015; Alam et al., 2011; Morteza, Daniel, and Jose, 2011; Tan, Chong, Lin, and Eze, 2009; Molla and Licker, 2005b; Teo, Wei, and Benbasat, 2003; Thong and Yap, 1995). These are examples of seminal studies studies related to the adoption of e-commerce.

Even though the e-commerce studies began in the 1990s, however this issue still becomes an interesting topic to be studied now. During the 1990s to 2008, mostly e-commerce studies were conducted in developed countries. Based on an extensive review of 345 papers related to IT innovation, published in 19 peer-reviewed journals between 1985 to 2007, conducted by Williams, Dwivedi, Lal, and Schwarz (2009), it was shown that 82.7% of the IT studies were conducted in developed countries, while studies of IT conducted in developing countries were limited, if any, and most of these studies still focussed on large businesses. Since the past few years, e-commerce studies conducted in developing countries have started, although mainly for certain African and Arab countries along with China.

As commonly known, there is a different between countries, not only between developing countries and developed countries, but also amongst developing countries or amongst developed countries. The differences are not only seen in regard to an economic standpoint, but also in political, environmental and social cultural factors. The biggest differences, of course, are seen between developed countries and developing countries. For example, businesses in developed countries have enjoyed relatively high quality infrastucture, high quality human resources and stable government; while businesses in most developing countries are still difficult to get such infrastructure, and human resources (Molla and Licker, 2005a), and they are also facing unstable government. These differences certainly have an impact on the application of technologies, models or strategies. The technologies, model or strategies that was initially developed and based on certain conditions, for example developed countries, cannot directly be applied to developing countries, as well as the research findings from developed countries conditions cannot be generalized into developing countries. To be applied, of course, it takes some adjustment in accordance with the conditions in a particular country.

The differences in term of economics, political conditions, environmental and social cultural factors can also be seen among developing countries. For example,

in Arab countries (Jordan, Egypt, Sudan, Lebanon and Saudi Arabia), it was found that there were specific cultural beliefs, such as prefering face to face dealing that make them tend to be against certain technology interfaces; and create family-like environment in business organization, and all that beliefs caused their technology-related responses more slowly than other countries (Ghobakhloo and Tang, 2013; Straub, Loch, and Hill, 2003). In addition, the level of technology readiness, support from government, and competitiveness also vary greatly among developing countries. Hence it could also be reasoned that the research finding obtained in certain developing countries cannot be generalized into other developing countries.

Zhu and Kraemer (2005) revealed that variation in economic, political, environmental, social and cultural factors will greatly affect the extent of the diffusion of technology innovation across countries. So, it can be thought that the levels of IT use by businesses in developed countries are different in each developed countries, or even among developing or developed countries, as are the factors shaping that use (Kurnia, Karnali, et al., 2015; Zhu and Kraemer, 2005).

As was mentioned previously, most of the previous e-commerce adoption studies focused on large businesses. Large businesses are different to small businesses. SMEs are not just 'a little big business' (Welsh and White, 1981), and so, because of their size, they exhibit unique features and behaviours such as centralized management control and decision making, being more likely to be risk averse, lacking resources and only having a limited share of the market (Kartiwi and MacGregor, 2008). Moreover, in the enterpreneurial marketing domain, SMEs planning may be more informal than formal. All of these features make it difficult to apply 'large company'strategy and especially an e-commerce strategy which developed initially to fulfil the needs of large businesses in developed countries.

Limited studies regarding e-commerce adoption conducted on SMEs, especially in certain developing countries, such as Indonesia, becomes an opportunity for the researcher to do further study.

Issues that have been discussed in previous e-commerce studies also vary. In general, these issues can be classified broadly into upstream issues and downstream issues. The upstream issue studies tend to focus on the factors that facilitate or hinder business in their e-commerce adoption, while the downstream issue studies relate to the post adoption benefits of e-commerce (Molla and Heeks, 2007). Most studies have focused on either the upstream issues or downstream issues (Molla and Heeks, 2007). Studies that focus on both issues are rarely found, whereas to be able to provide a comprehensive understanding of e-commerce adoption by businesses, such studies are needed. This condition is certainly another gap in e-commerce adoption studies

Other gaps relate to the application of theory in e-commerce studies. E-commerce literature has used several theories or models to investigate and to explain the adoption of e-commerce technology by businesses. Some of the theories that have been widely applied in e-commerce studies are:

1. Theory Reasoned Action (TRA), developed by Fishbein and Ajzen (1975)
2. Theory of Planned Behaviour (TPB), developed byAjzen (1991)
3. Technology Acceptance Model (TAM), developed byDavis (1989)
4. The Perceived e-Readiness Model, developed by Molla and Licker (2005a)
5. The Diffusion Innovation Theory (DIT), developed byRogers (1983)
6. Technological, Organizational and Environmental (TOE) Framework, developed byTornatzky, Fleischer, and Chakrabarti (1990)

Even though an explanation of each theory has been made in Chapter Three, it suffices to mention here that most of these theories have been designed based on developed countries conditions (Tan, Tyler, and Manica, 2007) and the theories have been applied in studies conducted in developed countries, such as the US, UK, Australia, New Zealand, and Europe. There are few studies that represent the developing countries, and especially Indonesian, context. The differences in term

of cultures and business philosophies between businesses in developed countries and developing countries suggest a limited applicability and transferability of e-commerce models that were originally designed for western countries (Tan et al., 2007).

In addition, no single theory of innovation adoption exists (Hameed, Counsell, and Swift, 2012) and even some of these theories complement each other. Each theory has certain specificity and is applied to a particular issue as well, so the theory may be applicable to that particular study but it is not appropriate in the other studies.

Putting it all together, the discussions above show that there are several gaps in e-commerce studies; in term of the number of studies, issues discussed and theories applied. Therefore, in order to fill these gaps, this study aims is to provide a comprehensive understanding of e-commerce adoption by SMEs in Indonesia. This study not only focuses on the factors that influence SMEs in adopting e-commerce, but also investigates the benefits gathered by the SMEs and the impact of it on their performance. In order to provide a comprehensive picture of e-commerce adoption by SMEs, a combination of TOE and IDT are applied in this study.

## 1.4 RESEARCH OBJECTIVES AND RESEARCH QUESTIONS

Based on the explanation above, the following are presented as the objectives of this study.

a. To investigate the extent of the adoption of e-commerce by SMEs in Indonesia.
b. To identify factors that influence SMEs in Indonesia in adopting of e-commerce
c. To identify benefits gathered by SMEs in Indonesia by adopting e-commerce

d. To investigate the relationship between e-commerce adoption and SME performance.

Therefore, the reseach questions of this study are:

a. To what extent have Indonesian SMEs adopted e-commerce?
b. Which factors influence SMEs in Indonesia in adopting e-commerce?
c. What are the benefits gathered by the SMEs in Indonesia by adopting e-commerce?
d. Is there any relationship between the e-commerce adoption with the SMEs market, communication and cost reduction performance?

## 1.5 OVERVIEW OF INDONESIA

Astronomically, the position of Indonesia is at $6^{o}$ north latitude to $11^{o}$ south latitude and between 95° east longitude to $141^{o}$ east longitude. From this astronomical position, it is known that Indonesia lies in the eastern part of the earth and it is on the equator. It has a tropical climate and there are only two seasons: the dry season and the rainy season. Like other tropical countries, Indonesia has many natural resources both renewable (agricultural products) and non-renewable (mining and minerals), so it is not surprising that it is often called '*the emerald from the equator'* (Wiratama, Kurniawaty, Febriane, Putri, and Haekal, 2014*)*.

Geographically, Indonesia is lying in a cross position between two oceans; the Indian Ocean and the Pacific Ocean, and two continents; Asia and Australia Continent (see Figure 1.1). This position between two oceans has an impact on the Indonesian climate, in which the changes of wind direction happen every sixmonths, so resulting in just two season. The Indonesian climate is characterized as a maritime climate; and it is strongly influenced by sea breezes and land breezes. On average, the daily temperature in Indonesia is ranging from $18^{o}$ to $24^{o}$C.

Figure 1-1: Map of Indonesia

Indonesia is known as an archipelago country. It is the biggest archipelago country in the world, consisting of more than 17,000 islands. According to the Department of National Coordinating Survey and Mapping Indonesia (*Badan Koordinasi Survey dan Pemetaan Nasional - BAKOSURTANAL*), the total number of islands registered in Indonesia in 2014 is 13,466 islands; with a total area of 1,919,440 squares kilometres. The difference in these two numbers is because, for example, some of these islands may only appear at low tide. Indonesia has a population of more than 200 million people (in 2013), and so has the 4th largest population in the world. Most of whom are living in the five biggest islands, which are Sumatra, Kalimantan, Java, Sulawesi and Papua.

Indonesia is still categorized as a developing country, with a Gross Domestic Product of US$ 868 billion in 2013 (World Bank, 2013). Indonesian economic growth is good and according to data provided by the Central Bank of Indonesia (2013), economic growth was around 6% per year between 2009-2013. Gross National Income (GNI) measured by Purchasing Power Parity (PPP), rose from US$7,160 in 2009 to US$9,260 in 2013 (World Bank, 2013). Agribusiness, mining and marine are major sectors of the Indonesian economy.

Like other developing countries with regard to ICT development, before 2010, Indonesia was still lagging behind in comparison with other countries in Asia. The ICT development and e-commerce adoption in Indonesia are demonstrated in detail in Chapter Two.

## 1.6 SCOPE OF THE STUDY

This study focuses on the adoption of e-commerce by Indonesian SMEs in all industry sectors. In this study, the factors that influence SMEs in adopting e-commerce and the benefits gathered by these SMEs are identified and analysed. In addition to this, the impact of e-commerce adoption on the SMEs market, communication and cost reduction performance is also investigated.

Because the study was conducted in Indonesia, the definition of SME used in this study is the definition given by Indonesian government. In this regard, the SME is

defined as a business that has less than 100 employees or has annual sales less than IDR 50 billion and has total asset less than IDR 10 billion

In this study, e-commerce refers to conducting any business activities with the support of networked information and communication technologies (ICT), especially with the Internet. This study is limited to non-EDI (Electronic Data Interchange) e-commerce. Due to the expensive cost required for EDI adoption, this is not popular among SMEs, including those in Indonesia.

## 1.7 STRUCTURE OF THIS THESIS

This thesis is organised into seven chapters. Chapter One provides a general introduction to this study. In this chapter, the background of the study, the significance of the study, the rationale of the study and the objectives of the study are described.

Chapter Two discusses SMEs and e-commerce. In this chapter, the definition of SMEs and the important role of SMEs are explained. The definition of e-commerce, its classification, historical development and benefits are also presented. Then, this chapter also describes e-commerce adoption in SMEs.

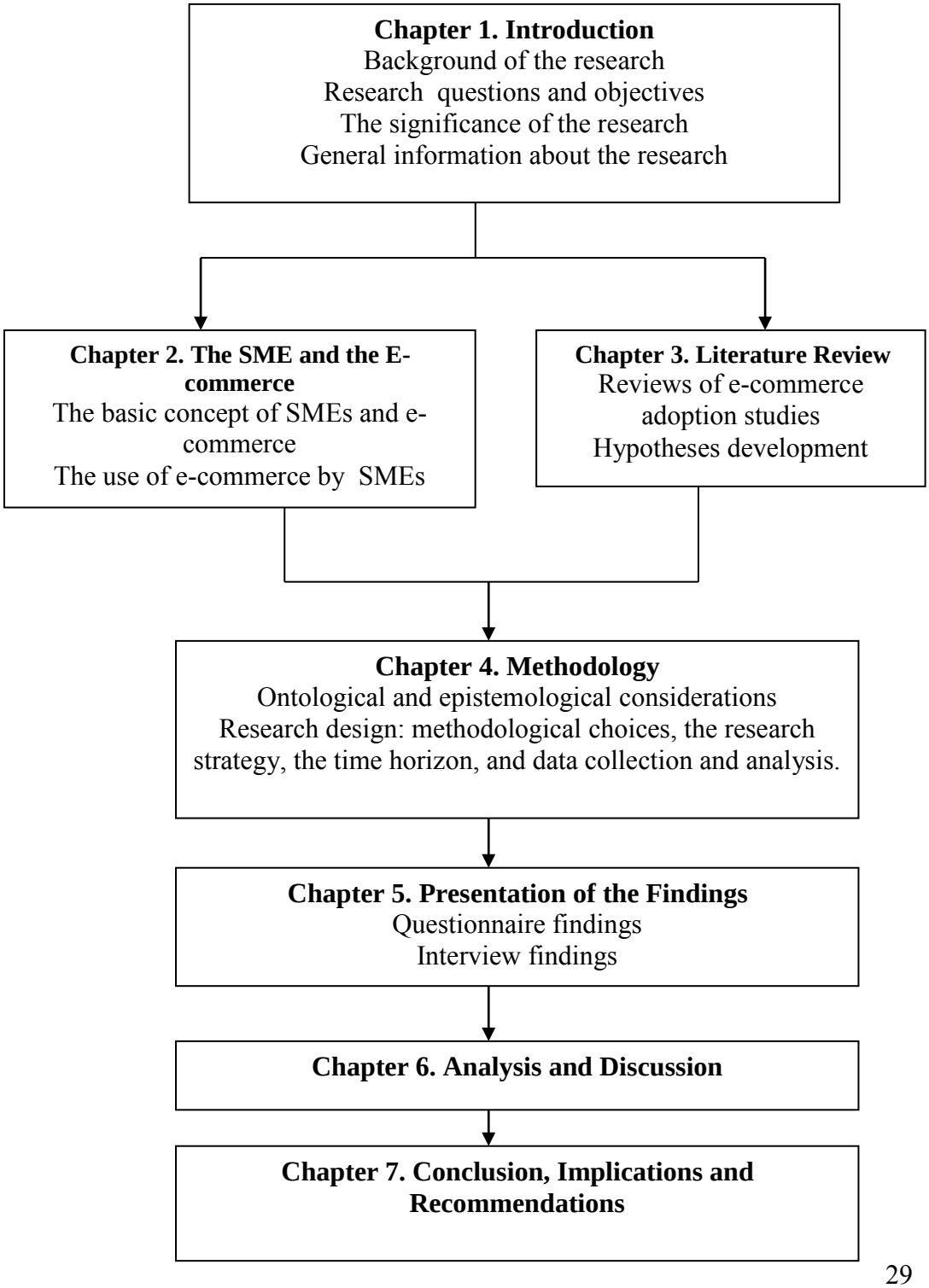
Chapter Three is the literature review chapter. This chapter starts by discussing previous e-commerce studies, including the theoretical foundation in e-commerce adoption studies, the application of such theories in e-commerce studies and also reviews e-commerce adoption studies. Then, based on this review, the hypotheses of this study are developed.

Chapter Four demonstrates the methodology for this study. It consists of several sections, which are: the ontological and epistemological consideration of the study, methodology choices, research strategy, time horizon, data collection and data analysis.

Chapter Five displays the result of the surveys and the interviews.

Chapter Six is an analysis and discussion chapter. In this chapter the results from the survey and the interviews are analysed and discussed.

Chapter Seven, which is the final chapter, summarises this study, the implications and contribution of the study, the limitations of the study and also the potential direction for future study. The structure of the thesis is summarized in Figure 1-2 below:



# CHAPTER 2: THE SME AND E-COMMERCE

## 2.0 INTRODUCTION

This chapter describes the application of e-commerce technology in Small and Medium Sized Enterprises (SME). There are three main sections in this chapter. It begins with an explanation about SMEs in general, including the definition and their role in section 2.1. Indonesian SMEs in particular, including definition, role, and problems faced by SMEs, and government policy regarding SMEs development are developed in section 2.2.

The overview of e-commerce technology is explained in section 2.3. In this section the definition, classification, brief history and potential benefits of e-commerce are explained in detail.

The next section, section 2.4, describes the application of e-commerce technology in SMEs and it is followed in section 2.5 by t explaining the internet and the internationalization of SMEs. Section 2.6 concerns the context of e-commerce in Indonesian, and finally, the conclusion of this chapter is in section 2.6.

## 2.1 SMALL AND MEDIUM SIZED ENTERPRISES (SME)

### 2.1.1 Definition of the SME

There is no consistent statistical definition of the SME in the world with the definition varies across country. In general, the categorizing of SMEs is based on several criteria, such as the number employed, total assets, shareholders and total revenues. Of course at the core of our of understanding is how the SME behaves, once we understand that we can then count the population. So, for example, in the United States, according to U.S Small Business Administration (SBA), a small business concern "is one that is independently owned and operated, is organized for profit, and is not dominant in its field". Likewise the Bolton Committee (1971) in the UK spent time understanding the nature of the SME before offering the seminal statistical categorisations that still form the basis of the UK classification.

The U.S. SBA categorizes business into small and medium enterprises differently depending on the industry, for example: in manufacturing, the business will be categorized as an SME if it has a maximum number of employees ranging from 500 to 1500, depending on the type of product produced, while in the wholesaling industry, the number of employees ranging from 100 to 500, depending on the products provided. Alongside the number of employees, the U.S SBA also categorizes business into an SME based on the annual revenues, for example: in the services industry, the characteristic of an SME is that the business has annual receipts that may not exceed $2.5 to $21.5 million, depending on the services provided, whilst in retailing industry, annual receipts may not exceed $5.0 to $21.0 million, depending on the particular product being provided. It can be seen, even in the same country, the statistical definition varies depending on the type of industry.

In Europe, according to European Commission, small enterprises are defined as a business who employs less than 50 people and who has annual turnover or annual balance sheet total of a maximum of 10 million Euro, while the micro enterprises refers to the business that employs less than 10 people, and has a turnover and balance sheet total of no more than 2 million Euro annually. Table 2-1 below shows the category of SMEs in Europe according to European Commission:

**Table 2-1**: Categorisation of SMEs in European Union Countries

| Enterprise category | Headcount: Annual Work Unit | Annual Turnover | Annual balance sheet total |
|---|---|---|---|
| Medium | < 250 | ≤ €50 million (in 1996 €40 million) | ≤ €43 million (in 1996 €27 million) |
| Small | < 50 | ≤ €10 million (in 1996 €7 million) | ≤ € 10 million (in 1996 €5 million) |
| Micro | < 10 | ≤ € 2 million (previously not defined) | ≤ € 2 million (previously not defined) |

Source: European Commision (2005)

In Australia, according to the Australian Bureau Statistics (ABS), the business will be classified as a small business if it employs less than 20 people, while the

business will be classified as a medium business if it employs 20 people or more, but less than 200 people. In addition, the definition of the SME also varies in the Asia Pacific Region. Table 2-2 below illustrates the range of SME definitions in the Asia-Pacific Region.

**Table 2-2:** Sample of SME definitions in the Asia-Pacific Region

| Country | Definition of SME | Measurement |
|---|---|---|
| China | Varies with industry, usually less than 100 employees | Employment |
| Hong Kong | *Manufacturing*: 100 or fewer employees<br>*Other*: 50 or fewer employees | Employment |
| Indonesia | Less than 100 employees | Employment |
| Japan | *Wholesale*: less than 100 employees or JPY 100 million assets<br>*Services*: less than 100 employees or JPY 50 million<br>*Retail*: less than 50 employees or JPY 50 million assets<br>*Other*: less than 300 employees or JPY 300 million assets | Employment and Assets |
| Malaysia | *Manufacturing*: less than MYR 25 million or 150 employees<br>*Service:* less than MYR 5 million or 50 employees<br>Different for Bumiputra enterprises | Shareholders, Funds and Employment |
| Philippines | Less than 200 employees or PHP 60 million assets | Employment and Assets |
| Republic of Korea | *Manufacturing*: less than 300 employees, or KRW 8 billion assets<br>*Wholesale*: less than 100 employees or KRW 10 billion annual sales revenue | Employment, Assets and Sales revenue |
| Singapore | *Manufacturing*: fixed assets worth SGD 15 million or less<br>*Services*: less than 200 employees | Employment and Assets |
| Taiwan | *Manufacturing*: less than TWD 80 million of paid-in capital or less than 200 employees<br>*Other*: less than TWD 100 million annual sales revenue or less than 50 employees | Sales revenue and Employment |
| Thailand | *Manufacturing and Services* – less than 200 employees or THB 200 million assets<br>*Wholesale*: less than 50 employees or THB 100 million assets<br>*Retail*: less than 30 employees or THB 60 million assets | Employment and Assets |

Sources: White Paper on Small and Medium Enterprises in Taiwan, 2006 as cited by Kotelnikov (2007: 2)

In recent years, it is inevitable that the use of such measures (the number employed, total assets, and shareholders) in regard to clasisify a business as an

SME becomes irrelevant. The statement of "the larger a business is, the more employees it will have" is not totally true to be used in this technology information era. As commonly known the development of information technology has been able to reduce the use of human resources significantly. Their role has been replaced by IT driven technology. Nowdays it is not difficult to find a large business who has a few numbers of employees. In addition to this, the development of information technology has also been able to minimize the use of human resource. Also IT technology allows us to run a business from anywhere.

Even though these measures are not entirely relevant to be used in classifying business, researchers still use such measures for defining the SME. For example, Duan et al. (2012) defined an SME as the business which eploys less than 200 people, however, Al-Qirim (2007) defined an SME as an enterprise employing 19 or fewer employees. Then, Johnston and Wright (2004) classified businesses as an SME if they have less than 500 employees, while others give different definitions. For more detail, Table 2-3 below describes the various definitions of SME used by several researchers.

**Table 2-3:** Sample definitions of relative size for "small" business

| Source | SME definition |
|---|---|
| World Bank Enterprise Survey | Small enterprises refer to the business which has employees between 5-19 people, while medium size refers to the business with 20-99 employees. |
| Al-Qirim (2007) | SME is the business not exceeding 19 employees. |
| Fernando Alonso and Guy (2005) | SME defined as a firm which has less than 250 employees employees, a turnover lower than 50 million €, and 25% or less is owned by a non-SMEs. |
| Johnston and Wright (2004) | SME is a firm with less than 500 people. |
| Santarelli and D'Altri (2003) | SME defined as a firm with fewer than 100 employees. |
| Rao, Metts, & Monge, (2003) | Small business is a business with fewer than 500 workers. |
| Thong and Yap (1995) | The criteria are: (1) the number of employees in the business should not exceed 100, (2) the fixed assets should not exceed S$12 million, (3) the annual sales should not exceed S$15 million. |

Even though the definition given by various parties in various countries are different, however, all of them recognize that the SMEs have an important role in

economic growth in any countries. The important role of SME is described in detail in the next section.

### 2.1.2 The Important Roles of the SME

It cannot be denied that SMEs play significant role in term of economic growth. On average, 95% of businesses in the world are SMEs; and they absorb up to 65% of employment (Kotelnikov, 2007). These SMEs make a significant contribution, not only in term of their number but also in terms of provision of employment in almost all countries in the world. For example, in the United States, based on a statistictical report of the Small Business Administration (SBA) Office of Advocacy (2011) it was revealed that small firms represent 99.7% of all employer firms. They employ around 49.6 % of all private sector employees and have provided 60% to 80% of net new jobs annually for the last decade. In the United Kingdom, a Federation of Small Businesses Report (2012) noted that SMEs accounted for 99.9% of all private sector businesses and employed more than 14 million people (59.2% of total private sector employment), while for the European Union, referring to the annual report on SMEs in the EU (2011/12), approximately 99.8% businesses are SMEs who provided 67.4% of all employment and contributed 58.1% of Gross Value Added. Not only in developed countries but also in developing countries, such as Malaysia, Thailand, Philippines and Indonesia, a huge number of SMEs (on average 97% of all businesses) also exist, and which, likewise provide more than 60% of the employed population. For more detail, the following table shows the contribution of SMEs to total enterprises, employment and value added in selected developing countries in Asia:

**Table 2-4:** SME's contribution to Total Businesses, Employment and Value Added in selected developing countries in Asia, 2000-2008

| No | Country | Number of unit (%) | Employment (%) | Value Added (%) |
|---|---|---|---|---|
| 1 | China | 99.7 | 74.0 | 60.0 |
| 2 | India | 95.0 | 80.0 | 40.0 |
| 3 | Indonesia | 99.9 | 99.0 | 63.1 |
| 4 | Malaysia | 94.4 | 40.4 | 26.0 |

| No | Country | Number of unit (%) | Employment (%) | Value Added (%) |
|---|---|---|---|---|
| 5 | Philippines | 99.6 | 69.1 | 32.0 |
| 6 | Thailand | 98.0 | 55.8 | 47.0 |
| 7 | Vietnam | 96.8 | 96.8 | 39.0 |

Source: Tambunan (2009)

Supporting evidence is also given by Ayyagari et al. (2011). Based on a survey of 104 countries during 2006 to 2010, they found that the SME made a significant contribution in terms of employment and job creation. The result showed that the SME contributed 47.94% of employment on average. Then, the SMEs also contributed 75.6% to job creation. Comparing to large companies, this contribution is quite considerable. In this regard, job creation refers to "the population estimate of the change in the number of permanent, full time employees over two years, also derived by aggregating the change in employment reported by each firm in the survey multiplied by its sampling weight" (Ayyagari et al., 2011: 7).

According to UNIDO & World Summit on Information Society (2003), SMEs, especially in developing countries could decrease the poverty rate. This is because in developing countries, "the SMEs are the main source of income, a breeding ground for entrepreneurs and a provider of employment" (WSIS Report, 2003). Even more, Liedholm and Mead (1999) revealed that the SMEs also contribute to:

1. Household income and welfare:
    a. Providing income maintenance for those with few options;
    b. Providing a basis for growth in income and welfare through asset accumulation, skill development, and access to more rewarding economic opportunities;
    c. Providing employment;
2. Self-confidence and empowerment of the individual:
    a. Recognition of the dignity of the individual;
    b. Spreading the vision that changes is possible;
3. Social change, political stability, and democracy:
    a. Through increasing confidence in local, representative, community-based institutions;
    b. Through the development of individual feelings of responsibility and participation in governance;

c. Thought the creation of institutional structures reflecting people's needs and objectives

4. Distributional or developmental objectives
    a. Providing new opportunities for the poor;
    b. Providing new opportunities for women;
    c. Providing new opportunities for those in rural areas, and in isolated locations;
5. The area of demographic change:
    a. Through reduction in birth rates;
    b. Through reduction in rural-urban migration

Source: Liedholm and Mead (1999: 7-8)

Hence, it is clear that the SME makes a considerable contribution to economic growth not only in developed countries, but also in developing countries. This condition is also experienced by Indonesia. As one of the developing countries, the existence of the SMEs in contributing to the Indonesian economy has been proven. This is described in more detail in the following sub section.

## 2.2 THE SME IN INDONESIA

Indonesia is one of the developing countries and consists of more than 250 million people dispersed over 17,000 islands. As other developing countries, most businesses are small to medium-sized enterprises. More than 99% businesses in Indonesia are SMEs, and they play a significant role in the economy. This section will describe the SME in Indonesia, and consider the definition, importance, problems and government policies regarding the SME.

### 2.2.1 The Definition of the SME in Indonesia

As previously mentioned, there is no specific definition of term the SME. Even in Indonesia, we can find several definitions given by different institution. For example, the Central Bureau of Statistics (CBS, 2004) will classify a business as an SME if it meets several criteria related to the number of employees, total assets and annual turnover. Table 2-5 below describes the criteria in detail.

**Table 2-5:** Criteria of SME based on The Central Bureau of Statistics

| No | Description | Criteria | | |
|---|---|---|---|---|
| | | Employees | Asset | Annual turnover |
| 1 | Small business | 5-9 people *and/or* | <IDR 1 billion (EUR 8.5 million) *and* | <IDR 200 million (excluding land and building) |
| 2 | Medium Business | 20-99 people *and/or* | > IDR 1 billion (EUR 8.5 million) *and* | < IDR 10 billion (excluding land and building) |

Source: The Central Bureau of Statistics, 2004

For tax purposes, small business is defined as the business which has assets valued between IDR 50 million and IDR 500 million with an annual turnover between IDR 300 million and IDR 2.5 billion. Medium business refers to the business that has assets valued between IDR 500 million and IDR 10 billion and also has annual turnover between IDR 2.5 billion and IDR 50 billion.

The definition of SME in Indonesia is also given by the Indonesian government. The central government through the Law No. 20 Year 2008 defines the SME as a business which is owned by an individual or business entity which is not a subsidiary or branch company and it is not owned and controlled by a medium sized or large business. Besides this definition, the Law No.20 Year 2008 also reveals two indicators of SME, which are based on sales per year and total asset (land and building are not included). Table 2-6 below shows these criteria in detail.

**Table 2-6:** Category of SME based on The Law No. 20 Year 2008

| No | Indicators | Micro Business | Small Business | Medium Business |
|---|---|---|---|---|
| 1 | Sales per year | ≤ IDR 300.000.000 | IDR 300.000.000-≤ IDR 2.500.000.000 | IDR 2.500.000.000-≤ IDR. 50.000.000.000 |
| 2 | Asset (land and building are not included | ≤ IDR. 50.000.000 | IDR. 50.000.000 -≤ IDR. 500.000.000 | IDR 500.000.000-≤ IDR 10.000.000.000 |

Sources: Indonesian Ministry of Cooperatives and Empowerment of Small Medium Enterprises, in www.depkop.go.id

The definition given by Indonesian Law No.20 year 2008 has been used in many researches in Indonesia. Hence, to allow comparability between this research and other research, this definition is also used in this research.

### 2.2.2 The Important Role of the SME in Indonesia

The important role of SMEs in the Indonesian economy cannot be denied. They make a significant contribution to Indonesian macro economic performance. This can be seen in Table 2-7 below.

**Table 2-7:** Contribution of SMEs to Indonesian Macroeconomic Performance (2008-2011), in %

| No | Type of Contribution | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|
| 1 | To the number of business | 99.99 | 99.99 | 99.99 | 99.99 |
| 2 | To Employment Rate | 97.15 | 97.3 | 97.22 | 97.24 |
| 3 | To Gross Domestic Product (GDP) at current prices | 55.67 | 56.53 | 57.12 | 57.94 |
| 4 | To Gross Domestic Product (GDP) at constant prices | 58.35 | 58.17 | 57.83 | 57.6 |
| 5 | To National Export | 18.1 | 17.02 | 15.81 | 16.44 |

Source: Indonesian Office of Statistics and Indonesian Ministry of Cooperatives and Empowerment of Small Medium Enterprises, 2013 in www.depkop.go.id

Table 2-7 shows that the contribution made by SMEs can be classified into five main categories, which are: number, employment provision, GDP at current prices, GDP at constant prices and national exports. In terms of number and employment rate, the table shows that SMEs contributed 99.9% of businesses in Indonesia and provided more than 97% of work places. A considerable amount of this contribution is also shown in Gross Domestic Product (GDP) at current price and GDP at constant price. SMEs contributed 55.67% of GDP at current prices in 2008, and it increased significantly to 57.94% in 2011. In GDP at constant price, they contributed 58.35% in 2008 and 57.6% on 2011. In regard to national exports, SMEs contributed 18.1% in 2008, and slight decrease to 16.44% in 2011. Overall, these figures imply that the SME has an important role in the Indonesian economy.

Besides their contribution to these five key macro economic performances, SMEs are also considered to have potential power to survive in any condition. It has

been proven by them when financial crisis was happened in Indonesia in 1997 to 2000. At that period, there were so many businesses collapsing due to the crisis; however, the SMEs could survive in this condition. A similar condition also happened in 2008-2009 where the SMEs also showed their ability to survive this second financial crisis. The ability of SMEs to survive a financial crisis could be for the following reasons (Partomo, 2004):

a. The majority of SME produced consumer goods and services which have a low demand elasticity of income, so that the demand of such products was not affected by the fluctuation of income;
b. The Majority of SMEs do not get a loan from the bank, so that higher interest rates have no effect on this sector;
c. The SMEs has flexibility to change their core business.

Therefore, it is inevitable that SMEs play an important role in the Indonesian economy. In spite of their contribution, however when the proportion of SMEs is compared with the numbers of large companies, it is seen that the contribution of the SME into Indonesian Growth Domestic Product (GDP) is still far below the large company. Table 2-8 below shows the comparison between the numbers of SME and large companies with the contribution of SMEs and large companies into Indonesian GDP.

**Table 2-8:** The contribution of SME and Large Company into Indonesian GDP, 2006-2007 on Average (%)

| Type of Industries | % of numbers | | % contribution to GDP | |
|---|---|---|---|---|
| | SME | Large | SME | Large |
| Agribusiness | 0.452 | 0.000 | 95.75 | 4.25 |
| Mining | 0.006 | 0.001 | 11.41 | 88.6 |
| Manufacture | 0.111 | 0.020 | 23.9 | 76.1 |
| Electricity, gas & water supply | 0.001 | 0.001 | 8.11 | 91.9 |
| construction | 0.008 | 0.000 | 66.06 | 33.9 |
| Trade, Hotel & Restaurant | 0.245 | 0.002 | 96.45 | 3.55 |
| Transportation & communication | 0.037 | 0.001 | 52.96 | 47 |
| Finance, rent & services | 0.028 | 0.002 | 63.72 | 36.3 |
| Other Services | 0.085 | 0.001 | 47.18 | 52.8 |
| GDP | | | 53.55 | 46.5 |
| Numbers | 0.973 | 0.027 | | |

*Source:* The Central Bureau of Statistics, 2007 in Tambunan (2009: 5)

Table 2-8 above shows that even though the numbers of SMEs are bigger than large companies however in several industry types, the contribution of SMEs is far below that of large companies. It can be seen that SMEs in the mining sector make less contribution (11.41%) into Indonesian GDP compared to the large company (88.6%). A similar condition is also seen in other sectors, such as manufacture; electricity, gas & water supply sector and other services. However, in entirely, the contribution of SME is not so poor when compared to the large company. Overall SMEs contribute 53.55%, whilst large companies contribute 46.5% of Indonesian GDP.

This implies that the SME still has the opportunity to make a bigger contribution to the Indonesian economy, and their role could be raised significantly if they can be managed and developed appropriately. One of ways considered as the best way to achieve this is by encouraging them to use Information and Communication Technology (ICT), especially e-commerce technology.

### 2.2.3 The main problems facing Indonesian SMEs

Like SMEs in other countries, SMEs in Indonesia also face many problems. Mourougane (2012) and Irjayanti and Azis (2012) reported several main problems

faced by the Indonesian SMEs. Firstly, most Indonesian SMEs have a problem related to a lack of financial resources. This is due to the difficulty to get financial funding from a financial institution, such as Banks. It is because most of SMEs are not legally registered as a company. Based on survey conducted by World Bank Enterprises in 2009, only 25% of small businesses are legally registered when they start their business. As commonly known the financial institutions usually have a preference to fund those who are incorporated. In addition, unavailability of collateral is also considered as an inhibiting factor to get funding from a financial institution.

The second problem faced by Indonesian SME relates to poor infrastructure. In Indonesia, the road and railway network are still of poor quality. This condition causes high transportation costs. Currently, as reported by Indonesian Institute for Science (LIPI), around 30% of production cost is associated with transportation costs. In addition, poor conditions also occurr in regard to the electricity infrastructure. According to World Bank report as mentioned by Mourougane (2012), Indonesia lays towards the bottom position (161$^{st}$ from 181 countries) regarding a reliable electricity supply. This problem not only impacts on the high production cost, but it also could be an inhibiting factor to technology information adoption.

The third problem is associated with a lack of employee skills. Irjayanti and Azis (2012) mentioned the lack of employee skills may be due to a lack of education and training. Currently, only about 8% of employees in Indonesia graduated from undergraduate study, and about 50% of employees in Indonesia only graduated from elementary school (*Master plan Percepatan dan Perluasan Pembangunan Ekonomi Indonesia*, 2011). This implies that the human resource in Indonesia is still at a low education level.

Other problems faced by Indonesian SME as reported by Irjayanti and Azis (2012) are economic factors, such as the government fiscal and monetary policies, the higher inflation rate, higher interest rate, and fluctuating foreign exchange rates, inefficient production cost, the higher prices of energy, lack of knowledge

in term of the international market, lack of infrastructure, and competition barriers.

The problems above will certainly become an inhibiting factor for Indonesian SME growth. In this regard, government support will be much needed to overcome or minimize these problems. In the past several years, the Indonesian government has demonstrated its efforts to assist the SME to solve these problems. These efforts are presented in next section.

### 2.2.4 The government policies in terms of SME development

In order to overcome the problems faced by SMEs in Indonesia, the government has issued several policies and strategies. For example, regarding SMEs' problem in accessing financial support, the government has launched several policies. Started in 1973 and ended in 1990; the government launched the Small Enterprises Development (KIK-*Kredit Investasi Kecil*/KMKP-*Kredit Modal Kerja Permanen*) programme and the Small Enterprises Credit (KUK-*Kredit Usaha Kecil*) programme. Both programmes were aimed to assist the SME to access financial support by providing a low interest rate, which was subsidized by government (Machmud and Huda, 2011). Then, after 1990, the government initiated another programme to replace the previous programmes, called the Small Enterprises Credit (KUK-*Kredit Usaha Kecil*) programme. This programme was different to the previous one in which the interest given was based on the market rate.

In 2007, the government issued the Presidential Instruction Number 6 year 2007 in terms of SME development. This Instruction consisted of three main policies, which are:

> …….increasing institutional capacity and access of Micro and SMEs to financing sources, strengthening the loan guarantee system for Micro and SMEs, and optimizing non-banking funds to empower Micro and SMEs (Machmud and Huda, 2011: 266).

By this instruction, the government launched the new credit scheme for Small, Micro and Medium Enterprises (SMME), namely micro credit loans (KUR-*Kredit Usaha Rakyat*). This scheme was also intended to assist the SME in

accessing the financial support from financial institutions. However, even though the government has introduced several programmes, there are still many SMEs who could not reach this programmes due to a lack of knowledge about the availability of such support.

In 2008, the Indonesian Government issued the Law No.20 Year 2008 about the Small, Micro and Medium enterprises. This law aims to empower small and medium enterprises through the growth of self-reliance, unity, and entrepreneurship; to make the public policy more transparent, accountable and equitable; to develop the business, which based on region-based and market-oriented accordance with the competence of SME; to increase the competitiveness of SME; and to implement the planning, execution, and integrated control ("UU No. 20 Tahun 2008 tentang Usaha Mikro, Kecil, dan Menengah" (2008).

Further, in May 2011, the Indonesian President issued the Master Plan for the Acceleration and Expansion of Indonesian Economic Development (*Masterplan Percepatan dan Perluasan Pembangunan Ekonomi Indonesia, MP3EI*). This programme provides a strategic plan for the next 15 years.

The Master Plan for the Acceleration and Expansion of Indonesian Economic Development (MP3EI) intended to promote the establishment of high economic growth that will be balanced, equitable and sustainable. At the same time, through the acceleration steps Indonesia will establish itself as one of the top ten nations in the world in 2025 and the sixth in 2050. (*Masterplan Percepatan dan Perluasan Pembangunan Ekonomi Indonesia*, 2011)

The MP3EI programme has three main programmes, which are the development of the economic potential through an economic corridor in six regions: Sumatera, Java, Kalimantan, Sulawesi, Bali-Nusa Tenggara, Papua and Maluku; strengthening national connectivity and locally integrated and globally connectivity; and strengthening human resource capabilities to support the development of the national science and technology.

The programmes are planned to be implemented over the next 15 years in three sequential phases, which are:

- From 2011 to 2015, the focus will be on measures that can be easily implemented, on speeding up the process of issuing pending regulations and on preparing the ground for the next phases. Few projects during this phase will represent new initiatives. Most appear to be projects that were already in the pipeline over the past several years
- From 2016-2020 the focus will be on the acceleration of long-term infrastructure development and on boosting innovation and promoting higher value-added industries.
- From 2021 to 2025, it is assumed that the foundation will be in place for Indonesian industries to compete globally and use high level-technology.

Source: Mourougane (2012: 25)

In this programme, the Indonesian Government will allocate IDR 4.276 trillion (equal to USD 468 billion) during 15 years to support the whole programmes. Through these programmes, the problems which related to the infrastructure, human resources and economic development, will be addressed.

The MP3EI programme shows that the Indonesian government is currently in full effort to make improvements on all sides, including the development of SMEs and the general use of information technology. This effort requires the support of various parties including the support of the researchers. Therefore, this research in term of e-commerce adoption is needed to be input for government policies and strategies.

## 2.3 OVERVIEW OF E-COMMERCE TECHNOLOGY

### 2.3.1 The Definition of E-Commerce

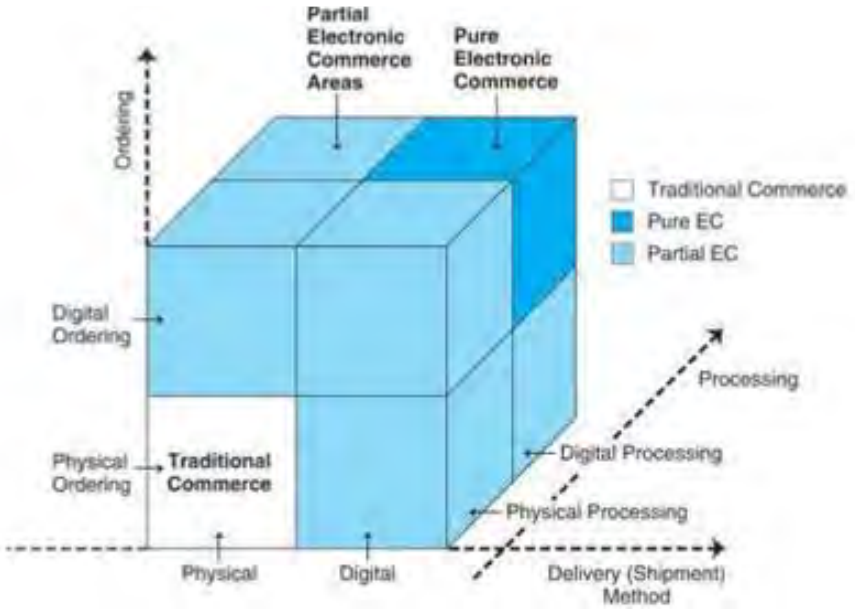
There is no single definition concerning e-commerce. Researchers have defined e-commerce variously, depending upon the individual focus or perspective of researchers. For example Turban (2010) defines e-commerce as “the process of buying, selling, transferring, or exchanging products, services, and/or information via computer networks, mostly Internet and intranets”. Clarke (2005) offers more detail elements of the e-commerce functions to define of e-commerce, which is “support services for trading . . . .It encompasses inter-organizational email, directories, trading support systems for commodities, products, customized goods

and services, management information, and statistical reporting systems". Then, Govindaraju, Chandra, and Siregar (2012) define e-commerce as "process of information exchange and transaction, involving products and services, through information technology such as network, software, non-wireless equipment, and wireless electronic equipment". Moreover, Tagliavini, Ravarini, and Antonelli (2001) mentioned that any economic activity conducted via internet is called e-commerce. Although a variety of definitions of e-commerce have been suggested, in this research e-commerce refers to conducting any business activities with the support of networked information and communication technologies (ICT), especially with the Internet.

E-commerce is different to traditional ways in respect of internet usage in the business process. In the traditional way, the business process starts from the customers who prepare a purchase document manually, print the document and send it to the supplier by fax or courier services. Then, on the supplier side, purchase documents will be re-entered by the supplier to their sales application, followed by preparation of the goods and delivery of the goods to the customer via a courier service. In contrast, in electronic commerce, several traditional steps, such as preparing the document manually, sending the document via fax or courier and their entering of the document, can be conducted electronically, and so these can be eliminated. As a result a transaction is conducted faster and in a more economic way.

Turban (2010) revealed that the transition from traditional commerce to electronic commerce depends on the degree of digitization (physical or digital) of three components which are the product or service sold, the process, and the delivery method. Figure 2-1 below shows the possible configuration of these three elements which determine the form of e-commerce.

**Figure 2-1:** The Dimensions of E-Commerce




Source: Whinston, Stahl, and Choi, 1997 as cited and redrawn by Turban (2010: 39)

The figure above shows that the product, the process, and the delivery method are classified into physical or digital. If there is at least one digital dimension (a product, the process or the delivery method), it means e-commerce exists, but only partial e-commerce. If there is no digital aspects on the product, the process or the delivery, it means the traditional commerce still exist; however, on the other hand, if the entire aspects are digital, it is recognized as pure e-commerce. Buying a mobile phone from www.apple.com is one example of partial e-commerce, because there are physical dimensions of this transaction which are product and the delivery method. However, buying software from www.amazon.com is the example of pure e-commerce, because all of dimensions are digital (product, process and delivery method).

In the e-commerce literature, purely physical organizations are refered to *brick(s)-and-mortar* (*old economy*) organizations. In contrast, organizations which conduct their business totally online are known as *virtual* (*pure-play*) organizations, and those organizations that conduct partial e-commerce are known as *click-and-mortar (click-and-brick*) organizations.

In information system literature, the term "e-business" is also introduced. It should be noted that e-business is different to the e-commerce, in which e-commerce is a part of e-business. According to the UK Department of Trade and Industry (DTI) (2001a), e-commerce is "a means of trading involving the use of electronics, principally through the internet, for the buying/selling process, including advertising, invitation to treat, and the negotiation and conclusion of contracts and performance", on the other hand, e-business has a wider definition than e-commerce, it is not just about conducting selling and buying electronically, but more than that it also relates to "servicing customers, collaborating with business partners, conducting e-learning, and conducting electronic transactions within an organization" (Turban, 2010: 47). As mentioned previously, this research focuses on *e-commerce adoption* rather than the e-business adoption.

### 2.3.2 A Classification of E-Commerce

E-commerce can be classified in several ways. One of the most common ways is based on the nature of the participant involved in e-commerce transaction. There are three major classifications of e-commerce based on this, which are:

(a) Business to business (B2B), is the e-commerce model consisting of businesses or other organization as members. It means that both sellers and buyers are businesses or other organizations. In this model, there is integration (through the internet, extranets, intranets, or private networks) between businesses system, which allows them to share information, to do automated trading and to collaborate. Usually, trading partners already are known and there is a business relationship between them. Turban (2010) stated that B2B provides benefits not only for seller but also for the buyer in terms of generating new sales/purchase opportunities, reduced cost, reduced time, increased productivity and improved quality of services.

(b) Business to consumers (B2C), which is where the business transaction is conducted by business to individual shoppers. In this type, there is no integration on their (sellers and buyers) system. Usually, the sellers

provide general information, such as their products and services offered, the terms and conditions. Amazon.com is an example of B2C.

(c) Consumer to consumer (C2C), which allow the consumer to conduct transaction directly with other consumers. In C2C, the consumers can sell their product directly to other consumers. Trading in www.ebay.com is one example of C2C.

There are other extended classification available, for example Turban (2010: 51) below, but because this thesis is concerned with the level of adoption, (a) and (b) above are sufficient.

> *Business-to-Business-to-Consumer* (B2B2C), which allows companies to provides some product or service to a client business. The client business maintains its own customers, who may be its own employees, to whom the product or service is provided
>
> *Consumer-to-Business* (C2B), e-commerce model in which individuals use the internet to sell products or services to organizations or individuals who seek sellers to bid on products or services they need.
>
> *Business-to-Employees* (B2E), e-commerce model in which an organization delivers services, information, or products to its individual employees
>
> *Intra-business e-commerce*: e-commerce category that includes all internal organizational activities that involve the exchange of goods, services, or information among various units and individuals in an organization.
>
> *Collaborative commerce*: e-commerce model in which individuals or groups communicate or collaborate online.

Source: Turban (2010: 51)

### 2.3.3 A Brief History of E-Commerce

Actually, the embryo of e-commerce technology emerged forty odd years ago, but in a different form. It was started by the development of EFT (Electronic Fund Transfer) technology, which allowed funds to be transferred from one company to another company electronically, in the early part of the 1970s. In the early 1980s, the ATM (Automatic Teller Machines) was introduced so allowing the customer to withdraw their money electronically.

Then, around 1980, EDI (Electronic Data Interchange*)* was introduced. EDI refers to "co-operative inter-organizational system (IOS) that allow trading partners to exchange structured business information electronically between separate computer applications" (Iacovou, Benbasat, and Dexter, 1995: 466). It allows business to exchange their information with their partners electronically without human intervention. Later, in the early 1990s, when the internet was commercialized, the term e-commerce was introduced and such procedures grew rapidly.

In recent years, e-commerce has developed significantly. In the beginning of e-commerce development, Turban (2010) called as the first generation of EC, e-commerce involved mainly for trading, e-services and corporate sponsored collaboration. But today, the e-commerce application is also used for social and enterprises social networks, which is known as *social computing*. Different from the first generation of e-commerce which focus on supporting organizational activities and business process; *social computing* is more focused on enhancing cooperation and interaction among people and on user-generated content. It allows people to connect and collaborate with others electronically, get and take advice from each other, share ideas, create their homepage for free and link to other Web locations in which they are interested.

### 2.3.4 The Benefits of E-commerce

As described previously, e-commerce is different to the traditional ways in terms of the use of internet network. The internet itself, as it is commonly known, is fast, provides broad access, is cheap and user friendly, so the use of it in business activity certainly exploits these advantages (Salwani, Marthandan, Norzaidi, and Chong, 2009). Then, Laudon and Traver (2014) revealed that there are eight unique features of e-commerce that makes this technology superior than other technology innovations, which are: ubiquity, global reach, universal standard, richness, interactivity, information density, personalization/customization, and social technology.

In addition to the explanation above, the benefits of e-commerce can also be explained logically by transaction cost theory. In this theory, transaction cost refers to the costs of coordination that spent on production and marketing activities (Wigand, 1997). It includes *the search cost*, which relates to the cost of gathering an information about products, sellers and buyers; the *contracting cost*, which refers to the cost in regard to the arrangement and accomplishment of the contract; the *monitoring cost*, which is the cost of ensuring the terms of the contract have been performed; and the *adaptation cost*, which pertains to the cost occurred in making revisions during the life of contract. In the traditional way, the cost paid by customers consists of the cost spend by manufacturer in making and marketing a products, the transaction cost spend by wholesaler, the transaction cost spend by retailer and also the transaction cost spend by customer themselves in order to obtain the product. By using e-commerce, some of these costs can be reduced significantly. In addition, e-commerce can also reduce the time needed to process the transaction. This is because e-commerce allows business to communicate with their supplier or customers directly without intermediaries and complicated procedures. Therefore, theoretically it is believed that e-commerce can reduce costs and reduce time spent by both businesses and customers.

Besides reduced cost and reduced time, the use of e-commerce allows business to expand their market reach and implement a *mass customization* strategy simultaneously (Chiliya et al., 2011). E-commerce enables businesses to provide as much information as they want to their customers (or potential customers) and at the same time they also can spread this information to customers/potential customers across a wider area. This condition allows business to provide a product/service that suits individual customers' needs and preferences and so creates a better relationship with their customers/suppliers (Barua, 2004). As a result, customer retention and loyalty will increase (Chiliya et al., 2011).

Alongside this theoretical explanation, several researchers have attempted to investigate the benefits gained by a business in regard to e-commerce adoption. For example, Kraemer, Dedrick, and Dunkle (2002) conducted a survey on 2,139

businesses in ten countries, which were Brazil, China, Denmark, France, Germany, Japan, Mexico, Singapore, Taiwan and the United States in regard to e-commerce use and adoption. This study found that there were several benefits gained by businesses since doing business on line. The top six benefits were improved customer service, efficiency in internal processes, extended sales area, improved competitive position, improved coordination with suppliers and increased staff productivity.

Kumar and Petersen (2006) also found that fifty-eight companies from various industries reported that e-commerce has improved their customer services, improved information availability, reduced cost and time, reduced error, and increased customer satisfaction. Then, Molla and Heeks (2007) found the top six e-commerce benefits felt by businesses in South Africa, were improved internal communication, improved company image, improved external communication, extending the market area, and an improve competitive position. This result was based on a survey conducted in 92 businesses in South Africa.

In addition, MacGregor and Vrazalic (2007b) summarized the benefits of e-commerce reported by previous studies in Table 2-9 below.

**Table 2-9**: The Benefits of E-commerce Reported by Previous Studies

| E-Commerce Benefits | Reported by |
|---|---|
| Lower administration costs. | Quayle (2002)<br>Brunn et al. (2002)<br>Poon et al. (1997)<br>Abell et al. (1996) |
| Lower production costs. | Stockdale et al. (2004)<br>Quayle (2002)<br>Poon et al. (1997)<br>Abell et al. (1996) |
| Reduced lead time/stock levels. | Quayle (2002), Abell et al. (1996)<br>Poon et al. (1997) |
| Increased sales. | Abell et al. (1996) |
| Increased internal efficiency. | Mustaffa & Beaumont (2004)<br>Tetteh& Burn (2001)<br>MacGregor, Bunker, & Waugh (1998) |
| Improved relations with business partners. | Hurwitz (2000)<br>Poon et al. (1997) |
| Access to new customers and markets. | Quayle (2002), Ritchie et al. (2001)<br>Raymond (2001), Sparkes et al. (2001)<br>Vescovi (2000), Poon et al. (1997)<br>Abell et al. (1996) |
| Improved competitiveness. | Woerndl et al. (2005)<br>Vescovi (2000) |
| Improved quality of information. | Stockdale et al. (2004)<br>Quayle (2002), Abell et al. (1996)<br>Poon et al. (1997) |

Source: MacGregor and Vrazalic (2007b)

Moreover, Turban et al (2010) described that the benefits of e-commerce are not only gained by businesses but it also felt by customers and society. Table 2-10 below shows the potential benefits of e-commerce that might be gained by businesses, customers and society.

It can be seen that the e-commerce offers many advantages; hence it is not surprising that there are so many businesses applying this technology to their business activities. However, the adoption of this technology is dominated by large businesses. Comparing with the large companies, SMEs are still far behind in term of e-commerce adoption (Long, Lan, and Duong, 2011; Kartiwi and MacGregor, 2008; Thong and Yap, 1995), despite this technology offering advantages to both large companies and SMEs. This condition has been a concern of many parties; governments, practitioners, academics and researchers. So, it is

not surprising that in the past several years the government in many countries give considerable attention to the adoption of e-commerce by SME through issuing policies and regulations to assist the SMEs to adopt information technology. For example, in Australia, several programmes and ICT policies, such as *The Building on IT Strengths* (BITS) *Incubator programme*; *the National Technology Online programme* (ITOL); the *Business Entry Point* (www.business.gov.au); and *the online Business Resources Facility*, have been undertaken in order to widen the use of e-commerce in SMEs (OECD, 2002). In the United Kingdom, *The UK Online for Business and Wales Information Society (WIS) initiatives* were introduced in order to assist SME in e-commerce adoption (OECD, 2002). Similar programmes are also found in countries such as Austria with "*Let's e Biz*" programme, Finland with "*eASKEL*" programme, Netherland with "*Netherland go Digital*" programme, Sweden with "*SVEA*" programme, Luxembourg with "*APSI/CRP-HT Guide*" programme and Ireland with "*PRISM initiative*" programme (OECD, 2002).

**Table 2-10**: Benefits of e-commerce

| Benefit | Description |
|---|---|
| Benefits to organization | |
| Global reach | Locating customers and/or suppliers worldwide, at reasonable cost and speed |
| Cost reduction | Lower cost of information processing, storage, distribution |
| Facilitate problem solving | Solve complex problems that have remained unsolved |
| Supply chain improvement | Reduce delays, inventories, and cost |
| Business always open | Open 24/7/365; no overtime or other cost |
| Customization/personalization | Make it to consumers' wish, quickly and at reasonable cost |
| Seller's specialization (niche market) | Seller can specialize in a narrow field, yet make money |
| Ability to innovate, use new business models | Facilitate innovation and enable unique business models |
| Rapid time-to-market and increased speed | Expedite processes; higher speed and productivity |
| Lower communication costs | The internet is cheaper than VAN private lines |
| Efficient procurement | Saves time and reduce costs by enablinge-procurement |
| Improved customer service and relationship | Direct interaction with customers, better CRM |
| Fewer permits and less tax | May need fewer permits and be able to avoid sales tax |
| Up-to date company material | EC may help small companies to compete againts large ones by special business models |
| Lower inventories | Using customization inventories can be minimized |
| Lower cost of distributing digitizable product | Delivery on line can be 90 percent cheaper |
| Provide competitive advantages | Innvative business models |
| Benefits to customers | |
| Ubiquity | Can shop any time from any place |
| More product/services | Large selection to choose from (vendor, product, styles) |
| Customized products/services | Can customize many product and/or services |
| Cheaper products/services | Can compare and shop for lower prices |
| Instant delivery | Digitized products can be downloaded immediately upon payment |
| Information ability | Easy finding what you need, with details, democ, etc |
| Convenient auction participation | Do auctions any time and from any place |
| No sales tax | Sometimes |
| Enable telecommuting | Can work or study at home |
| Electronic socialization | Can socialize online in communities yet be at home |
| Find unique items | Using online auctions, collectible items can be found |
| Benefits to society | |
| Enable telecommuting | Facilitate work at hme; less trafic, pollution |
| More public services | Make education, health, etc., available for more people. Rural area can share benefits; more services for the poor |
| Improved homeland security | Facilitate domestic security |
| Increased standard of living | Can buy more and cheaper goods/services |
| Close the digital divide | Allow people in developing countries and rural areas to accept more services and purchase what they really like |

Sources: Turban (2010: 77)

## 2.4 E-COMMERCE AND THE SME

Even though e-commerce was originally developed to meet the needs of large business in developed countries, it is more than suitable to be applied by the SME, both in developed countries and in developing countries. Several studies show that e-mail, websites, internet, intranet, extranet, Electronic Data Interchange (EDI), Electronic Fund Transfer (EFT) and barcodes are some of basic e-commerce technologies that are most likely relevant for the SME. Based on a survey of 75 SMEs (most of them with one to 20 employees) in Australia, Mustaffa and Beaumont (2004) found that e-mail, web pages and the internet were commonly used by SMEs in Australia, but EDI and FAQ were less frequently used. In the UK, through telephone interviews with 200 SMEs in the East of England, Drew (2003), found most of the SMEs had used e-mail, intranet and web site in their business activities. Similarly, in New Zealand, Al-Qirim (2007) also found that the SMEs had used internet, e-mail, and web site in their business activities; and even more, a small number of the SMEs in New Zealand havealready used intranet, extranet, FTP and EDI.

In addition, evidence from developing countries also showed a similar pattern. Morteza et al. (2011) also showed that 74.89% of 235 Iranian SMEs surveyed had used e-mail, 59.15% had a website, 45.96% had used internet, 37.45% had used extranet / VPN, 32.34% had used EDI and less than 25% had used ESCM and EFT. Then, a recent study conducted by Kurnia, Choudrie, et al. (2015) also found that SMEs mostly in Malaysia, that were classified as e-commrce adopters, used e-mail, internet and barcode, and even more some of them used intranet, extranet, EDI and EFT.

The use of these technologies by SME varies. Abell and Lim (1996) found that SMEs in New Zealand used the internet in order to communicate with internal and external parties, get information from suppliers, provide information, conduct R&D activities, to be seen to be at the forefront of technology, do market and product research, place orders with suppliers, and take orders from customers. Drew (2003) found that e-mail and intranet applications were used to do internal

communication; while websites were used to advertise and promote SMEs products, for sales to end customers, for sales to distributors, for recruitment and for procurement. Then, Mustaffa and Beaumont (2004) summarized the use of several e-commerce techniques by Australian SMEs in the following table:

**Table 2-11:** The use of e-commerce techniques by SMEs

| EC techniques | Use |
|---|---|
| Web Page | - Attract new customers<br>- Expand local markets |
| Have an FAQ page | - Tailor product/service to customers<br>- Stay in touch with customers<br>- Receive timely feedback |
| Advertise on the internet | - Reduce advertising cost |
| Use the internet | - Expand products/services<br>- Alternative supplies<br>- Enter overseas markets<br>- Overseas competitors into Australian market<br>- Bypass traditional supplier<br>- Sell direct to customer |
| Use internet EDI | - Cut order and delivery time<br>- Reduce data entry cost<br>- Increase data transfer speed<br>- Reduce data entry errors<br>- Hold less inventory |
| e-mail | - Stay in touch with customers<br>- Stay in touch with suppliers<br>- Stay in touch with business partners<br>- Stay in touch with employees |

Source: Mustaffa and Beaumont (2004: 90)

In line with this, summarizing from previous studies, Daniel and Wilson (2002) argued that the e-commerce technologies assist SMEs in wide range of activities, which are: providing information about the company, providing information about goods and services offered, taking and placing orders, receiving payment, delivering goods and service, after sales service or contact, identifying suppliers, purchasing inventory and non-inventory, communicating with internal and external parties, exchanging document and design with the customer or suppliers, searching for information, advertising and recruitment activities.

The explanation above shows that the e-commerce technology is also suitable to be applied in SMEs and it can be used by them in many business activities and moreover it certainly assists them to do so. Besides assisting the SME in conducting the wide range activities, e-commerce also provides many benefits for SMEs. MacGregor and Vrazalic (2006) study of 118 SMEs in Sweden, found seven benefits were experienced by SME through e-commerce. Namely, reduced cost, reduced stock overheads, improved load time, improved control, improved quality of information, increase sales and improved relations with business partners, were experienced by SME in adopting of e-commerce. MacGregor and Vrazalic (2006) categorized these benefits into two main categorizes, which are the first five benefits being "internal efficiency" factor and the last two of benefits being "marketing benefits" factor.

Based on survey of 678 SMEs in the UK, Daniel and Wilson (2002) also found six benefits realised by SMEs regarding e-commerce adoption. These were improved internal knowledge sharing, improved competitive position, enhanced and efficient service, attract new customers, improved supply and recruited staff on line. They also reported that the greatest benefits were being realised in the area of internal knowledge sharing and communication between employees within the firm. In the Italian context, Santarelli and D'Altri (2003) have found that e-commerce assisted SMEs in increased number of customers, extended markets and improved communication. Whilst, in three EU countries (United Kingdom, France and Germany), and the United States, Wade and Johnston (2007) found that the e-commerce helped SMEs in increased revenue growth, improved cost of goods sold and reduced coss..

Another study conducted by Tan et al. (2009) considered the issues faced by Australian small businesses regarding internet commerce adoption. Twenty three small businesses participated in this case-study based research and all of them experienced new opportunity since using internet commerce. For example, they found new customers, became part of a new business network, and whilst some of the businesses also experienced reduced time for information search and retrieval,

especially if they knew the exact address. Cost saving was also achieved by some business in respect of e-mail use.

A recent study conducted by Jahanshahi and Zhang (2013) also reported that enhanced company image and brand, reduced cost, improved customer service, improved business process flow, improved productivity were the top five important benefits of e-commerce reported by SMEs in three countries, India, Iran and Malaysia.

## 2.5 INTERNET AND INTERNATIONALIZATION OF SMEs

As described by Laudon and Traver (2014), the internet has eight unique features, which are ubiquity, global reach, universal standard, richness, interactivity, information density, personalization/customization, and social technology, that makes it superior than other technology innovations. This innovation is believed as one important factors that drive the globalization of business (Ruzzier and Hisrich, 2006).

Through its ability to eliminate geographical constraint, reduce advertising cost, improve communication internally and externally, and improved information availability, this technology offers many advantages for business, including SMEs to enter the global market easily and economically. This technology is recognized by many authors as an invaluable resources for SMEs in internationalization process (Loane, 2006).

The internationalization itself is "a synonym for the geographical expansion of economic activities over a national country's border" Ruzzier and Hisrich (2006:477). Or more simply, Griffith and White (2003) defined internationalization as a process in which business expands their operating from its domestic market places to international markets.

A study conducted by Loane (2006) found that the internet was used by internationalising SMEs in five countries (Canada, Ireland, Australia, New Zealand) to support all areas of operation in business activities, domestically and internationally.

## 2.6 E-COMMERCE IN INDONESIA

In Indonesia, the first technology internet was pioneered by Joseph Luhukay in 1984, through building the University of Indonesia Network (UINET) that linked with the UUNet in United States. At that time, Indonesia became the first country in Asia that connected to the global internet (Lim, 2005). Then, in 1994, the first commercial Internet Service Provider (ISP), which is PT. Indo Internet (Indonet), was establised in Jakarta. Since then, the internet technology has began to grow.

Until 2009, ICT development in Indonesia was not very good. According to the International Communication Union (2007), in 2007 the average values of some indicators of ICT development in Indonesia were still far behind than the average values of Asia and the world. Table 2-12 below is a comparison of key indicators of technologies information between Indonesia and the averages for both Asia and the world

**Table 2-12:** ICT indicators for Indonesia, Asia and the World

| Indicator | Indonesia | Average of Asia | Average of the world |
|---|---|---|---|
| Total number of telephones per 100 people | 34.87% | 44.92% | 60.04% |
| Cellular Mobiles per 100 people | 28.30% | 29.28% | 40.91% |
| Main telephone per 100 people | 6.57% | 15.81% | 19.39% |
| Internet users per 100 people | 7.18% | 11.57% | 17.39% |
| Broadband subscribers per 100 people | 0.05% | 2.71% | 4.30% |

Source: International Communication Union (2007)

In addition to this, the Nielson Global online survey conducted in 2008 showed that Indonesia was on the bottom position (number 13 from 14 countries) in Asia Pacific in term of on line transaction. Further, in respect of technology adoption by businesses, especially SMEs, Wahid (2007) found that only 20% of SMEs in Indonesia have a computer and few of them use it for strategic activity and external orientation. Most of them use the computer for daily activities such as typing of documents, calculating, and presenting data. According to the Economist Intelligence Unit (2009), in comparison to other countries Indonesia

was lagging behind in regard to e-business readiness, and was number 68 from 70 countries in 2008, and number 65 from 70 countries in 2009.

This condition certainly reflected the condition of e-commerce in Indonesia at that time. Based on data provided by *Employers Association of Indonesian Internet Service*, APJII (2008), the number of internet users in 2007 were 25 million, which was 10% of the Indonesian population, and only small portion of them conducted online transaction.

To improve these conditions, the Indonesia government has actually made various efforts. Several regulation and policies regarding ICT development have issued. It was started by issuing the Telecommunication Law in 1999, which was aimed to regulate the activities in the telecommunications sector in Indonesia. In 2000, the government set up the Indonesian Telematics Coordinating Team (TKTI) that was assigned to design policies regarding ICT development, determine the phases and priorities of the development and to monitor and control implementation. In 2001, this team succeeded in releasing the Indonesia's Action Plan to overcome the Digital Divide, Information and Communication Technology, that was formulated on Presidential Instruction No.6/2001. This team also released the Five Year Action Plan for the Development and Implementation of Information and Communication Technology in Indonesia. There were four issues discussed in this action plan: the policy and legal framework for telecommunication, information technology and e-commerce; human capacity building; infrastructure and application (TKTI, 2001).

The Indonesian government has also embedded ICT into their strategies and policies. For example, The Government Regulation Number 56 (2005) about the regional financial information system; The Government Regulation Number 9/15/PBI/2007 about the application of risk management in the use of information technology by private banking; The Law Number 11 (2008) about information and electronic transaction; and The Law Number 14 (2008) about public information transparency.

Then, because Indonesia is geographically dispersed, there is inequality in terms of ICT infrastructure. To minimize this condition, since 2010, the Indonesian government through the Ministry of Communication and Information Technology (Kementrian Komunikasi dan Informatika) issued a policy regarding to the provision of affordable internet access for rural communities by relying on satellite connections (Donny, 2014). More importantly, the Indonesian Government has stated explicitily in the Master Plan for the Acceleration and Expansion of Indonesian Economic Development (MP3EI), that in 2021 Indonesian industries can compete globally and use high level-technology. This reflects that the government has made serious efforts to develop ICT and its use, including e-commerce.

The impact of these efforts is fairly significant: the number of internet users are increasing every year. The APJII reported that in 2013, the number of internet users in Indonesia was 71 million (Marius and Pinontoan, 2013). This number has increased significantly from the number of internet users in 2007, which were 25 million. In addition, according to the Internet World Statistics (2014), Indonesia is included into the top five internet countries in Asia.

In spite of the increase of internet users, however in regard to e-commerce, Indonesia is still lagging behind compared to other countries. According to CIMB ASEAN Research Institute report, in 2013 total transaction of online retail market in Indonesia has reached US$1.3 billion, while at the same time other countries, such as Singapore has reached US$ 1.7 billion, Malaysia has reached US$1.3 billion, China has reached US$181 billion, Japan has reached US$ 119 billion, United States has reached US$395 billion, and the EU5 (EU's five largest economies) has reached US$1,221 billion (Olsen, Gergele, Chua, and Bartolucci, 2014).

Even though it appears that the total transaction reached by Indonesia is not too far from other ASEAN countries, such as Singapore and Malaysia, however when it is compared with the number of population and number of internet users, the total transaction reached by Indonesia is still far behind. As an illustration, the

population in Indonesia is 250 million, with around 39 million internet users and 5 million digital buyers. Whilst in Singapore and Malaysia it is 5.5 million and 30 million respectively, and their internet users are 4 million and 20 million respectively. Singapore has 3.2 million digital buyers and Malaysia 16 million. (Olsen et al., 2014). So it can be seen that whilst the population and internet users in Indonesia are far higher than in Singapore or Malaysia, total online transaction made by Indonesians is around one third of that in Malaysia, and for poulation size relative to digital buyers far lower than for Singapore. Given the population and base of internet users in Indonesia, as well as their vast territory, there should be a great opportunity to build online transactions and to increase sales revenue. Therefore, this condition is certainly an interesting one to study.

## 2.7 CONCLUSION

This chapter described the application of e-commerce technology in SMEs. In the first two sections, SMEs in general and SMEs in Indonesia, including their definition, their role and their problems, were explained. As generally known, there is no specific definition of the SME, every party in every countries has set their own definition. In this section, the various definitions of the SME were presented in section 2.1. That section also discussed the important role of the SME in world economic growth, particularly in the Indonesian economy. The problems faced by SMEs in general, Indonesian SMEs in particular, were also described in this section, as well as the government support to overcome the problems.

Then the last three sections of this chapter described e-commerce technology and its application to the SME. In this section, the definition of e-commerce, its classification, its potential benefits and its brief history were described in detail. Then, the application of e-commerce technology in the SME was also presented. In the last section, e-commerce development in Indonesia was explained.

# CHAPTER 3: LITERATURE REVIEW

## 3.0 INTRODUCTION

This chapter discuss the literature review related to the factors that affect e-commerce adoption by SMEs and the impact of e-commerce adoption on SME performance. This chapter starts by explaining six theories that are widely used as theoretical foundation in e-commerce studies in section 3.1. Then, it is followed by explaining the application of those theories in e-commerce studies in section 3.2, and these are reviewed in section 3.3.

The next section, section 3.4, discusses the determining factors that influence SMEs in their adoption of e-commerce. There are four main factors proposed as determinant factors of Indonesian SMEs in adopting of the e-commerce. These are: technological factors, organizational factors, environmental factors and individual factors.

Then, in section 3.5, the development of the e-commerce technology in an organizational context is introduced. The relationship between e-commerce adoption and business performance is described in section 3.6. Finally, the summary of hypotheses of this study and the conclusion are presented in section 3.7 and 3.8.

## 3.1 THEORETICAL FOUNDATION IN E-COMMERCE ADOPTION STUDIES

It is undeniable that e-commerce has become a popular topic for many parties, including researchers since the internet was commercialized in the early 1990s. It is interesting to be studied because this technology has eight unique features: ubiquity, global reach, universal standar, richness, interactivity, infomation density, personalized/customization and social technology, that make it different and more powerful than other technologies (Laudon and Traver, 2014).

A large number of studies have been conducted regarding this technology. Various theoretical models and frameworks have been applied or developed to study this. Among these, six theories that have been widely applied are the

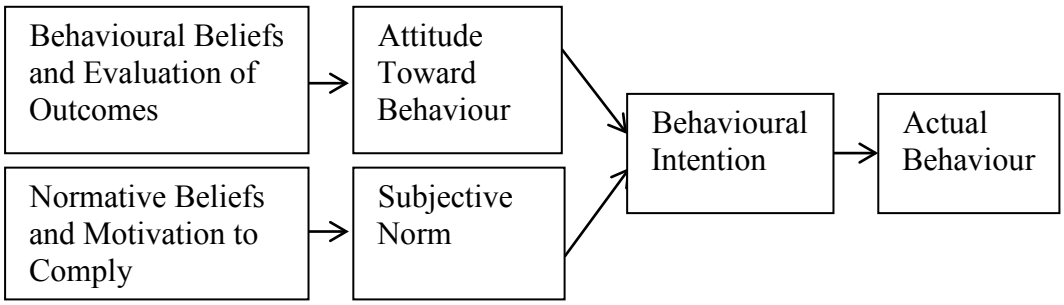
Theory Reasoned Action (TRA), Theory Planned Behaviour (TPB), Technology Acceptance Model (TAM), the Peceived e-Readiness Model (PERM), the Innovation Diffusion Theory (IDT) and Technology-Organization-Environtment (TOE) framework. Details of each theory are explained in the following section.

### 3.1.1 The Theory Reasoned Action (TRA)

TRA was initially developed, in social physiology, by Fishbein and Ajzen (1975) in order to explain determinant factors that affect an individual to perform a certain behaviour, especially volitional behaviour. According to this theory, an individual's behaviour is highly determined by their intention to carry out a behaviour, and that intention is jointly affected by two factors, which are their attitude toward behaviour and their subjective norm (Davis, Bagozzi, and Warshaw, 1989). The *attitude toward behaviour* (A) is defined as "an individual's positive or negative feelings (evaluation affect) about performing the target behaviour" (Fishbein and Ajzen, 1975: 216), while *subjective norm* refers to "the person's perception that most people who are important to him think he should or should not perform the behaviour in question"(Fishbein and Ajzen, 1975: 302).

Then, the person's attitude toward the behaviour is driven by their salient beliefs which resulted from their evaluation about the consequences of such behaviour; the subjective norm is driven by "multiplicative function of his/her normative belief, i.e., perceived expectations of specific referent individuals or groups, and his/her motivation to comply with these expectations"(Davis et al., 1989: 984). Fishbein and Ajzen (1975) described the relationship between all the determinant factors in Figure 3-1 below:

**Figure 3-1:** Theory of Reasoned Action (TRA)




Source: Fishbein and Ajzen (1975: 16)

This theory presumes that the greater a person's belief that the certain behaviour will have an positive impact for themselves, which means the more positive a person's attitude toward such behaviour, the greater the intention to carry out such behaviour, and certainly the greater chances for them so doing. Moreover, the greater pressure from social environment felt by a person about certain behaviour, with which they comply, will lead to a stronger of intention to perform such behaviour, and certainly will encourage them to carry out this behaviour.

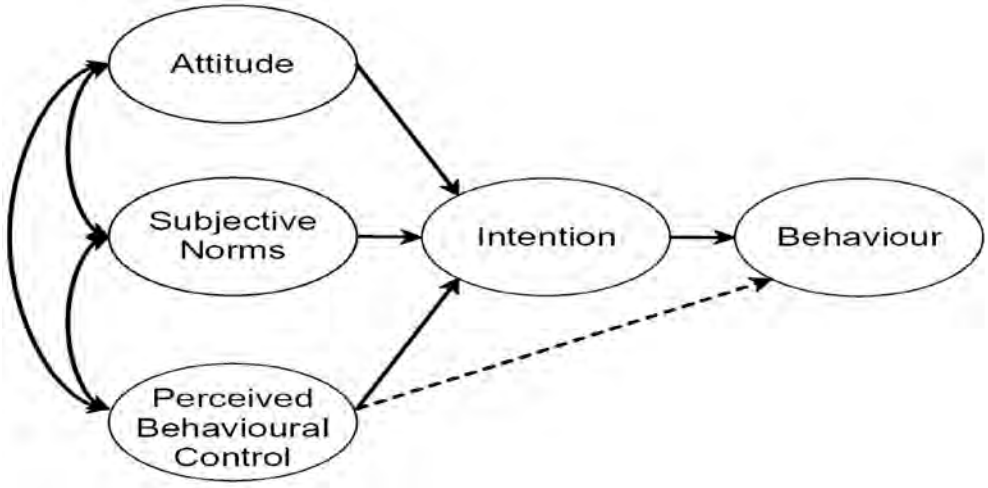
This theory is very general and it is not aimed at a specific behaviour (Davis et al., 1989), hence this theory has been applied widely to a range of fields, including e-commerce studies. This theory is considered as a successful model in predicting and explaining behaviour across these fields. However, in spite of being a successful model in wide variety of fields, this theory has been criticized for several reasons. For example, Ajzen (1991) mentioned that this model is unable to compromise with a situation in which individualis not under volitional control, such as spontaneus bahaviour, habitual behaviour, impulsive behaviour or mindless behaviour. This is due to a such behaviour might not require logical reasoning to be followed (Hale, Householder, and Greene, 2002). This theory is also unable to compromise with a certain behaviour that may require certain expertise, resources, event, or need a cooporation with other parties (Hale et al., 2002). Next, in this theory *attitude toward behaviour* and *subjective norm* are presumed to influence the behaviour intention seperately, however Hale et al. (2002) showed a strong evidence that both attitude toward behaviour and subjective norm are highly correlated, so that the model above was questioned. In addition, the predictive power of this model is also limited when applied to a situation in which actual behaviour and intention are highly correlated (Yousafzai, Foxall, and Pallister, 2010; Davies, Foxall, and Pallister, 2002) .

### 3.1.2 The Theory of Planned Behaviour (TPB)

The Theory of Planned Behaviour (TPB) was developed by Ajzen in 1991 and it is an extension of the Theory Reasoned Action (TRA) to overcome a limitation of the TRA in dealing with incomplete volitional behaviour. In this theory, one

construct, *perceived behavioural control (*PBC), is added to the previous model. *Perceived behavioural control* refers to "people's perception of the ease or difficulty of performing the behaviour of interest" (Ajzen, 1991: 183). For more detail, Ajzen (1991) description of this theory is shown in Figure 3-2 below:

**Figure 3-2:** Theory of Planned Behaviour (TPB)



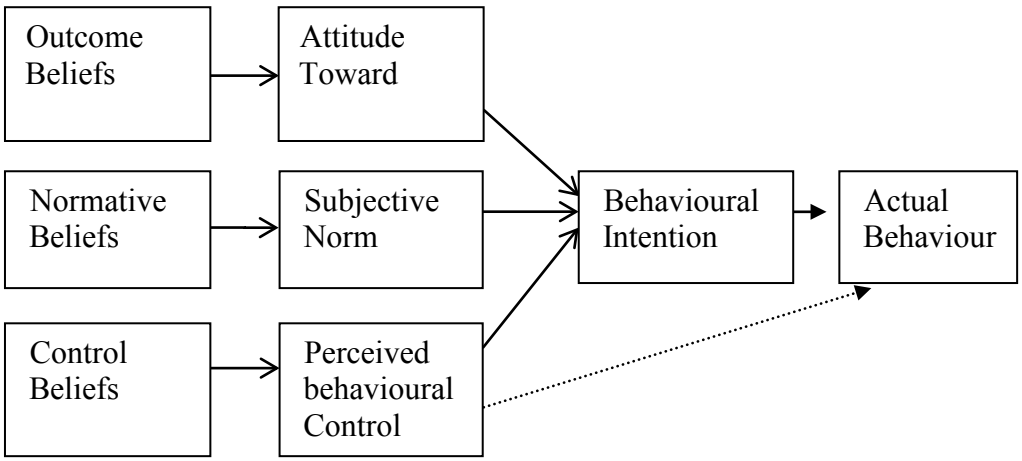

Source: Ajzen (1991: 182)

From the figure, it can be seen that behaviour is accordingly affected by intention and perceived behavioural control. As described earlier, the relationship between intention and behaviour can be simply explained, in which people tend to carry out a behaviour that they intend to do. While, the relationship between perceived behavioural control and behaviour can be explained in which people are more likely to carry out an attractive/desirable behaviour especially when they have a control on that behaviour. However, in contrast, if they do not have a control, they tend not to carry out that behaviour.

In this theory, besides affecting behaviour directly, perceived behavioural control is also presumed influencing the intention. Therefore, in this theory, intention to carry out a certain behaviour is determined by three things, which are *attitude*, *subjective norm* and *perceived behavioural control*. Similar with the TRA, the attitude toward in this model is also determined by the behavioural belief of the individual and the subjective norm is determined by normative belief. While, in

the TPB, the perceived behavioural control is driven by individul control beliefs regarding the resources and opportunities that is owned or not owned to carry out the behaviour and also the perceived power of each factor that encourage or discourage the behaviour (Ajzen, 1991). Figure 3-3 below elaborates.

**Figure 3-3:** Theory of Planned Behaviour




Similar to the TRA, the TPB has been criticized on several issues. For example, Armitage and Conner (2001) were concerned about the self-reporting of variables measurement. They argued that a self-reported measurement can lead to self-presentational biases. Davies et al. (2002) were concerned also about the measuring of PBC directly as opposed to recording control beliefs. Then, both TRA and TPB still assume that there is closeness between intention and behaviour, so the predictive power of this model is still weak if it applied to the situation in which intention and behaviour are highly correlated (Yousafzai et al., 2010; Davies et al., 2002; Foxall, 1997). Moreover, this model is also criticized because it ignores or does not include several factors which could be considered to increase the predictive power of this model, such as personal norm and affective evaluation of behaviour (Yousafzai et al., 2010; Davies et al., 2002).

### 3.1.3 The Technology Acceptance Model (TAM)

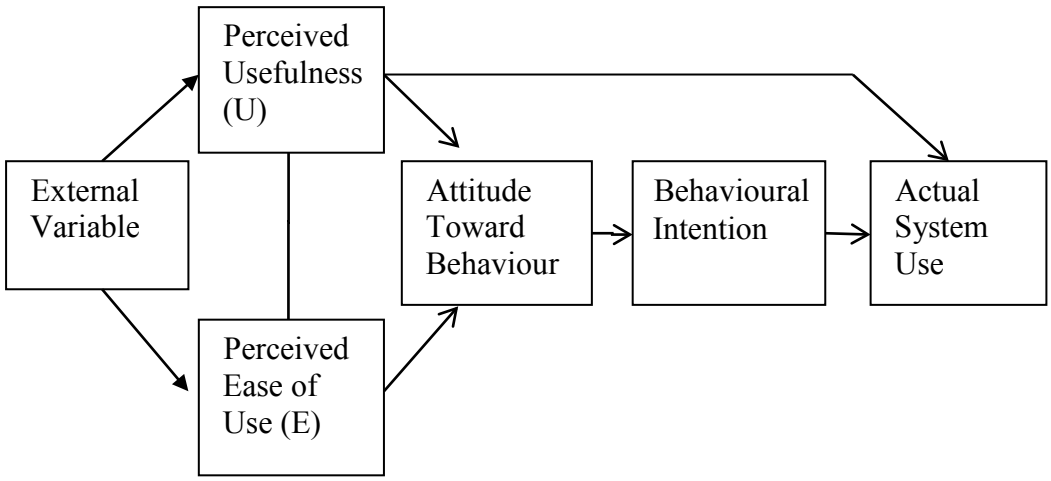
The Technology Acceptance Model (TAM) was originally developed by Davis (1989). He developed this model in order to provide a model that is pointedly

intended to explain an individual behaviour regarding computer use. Specifically, Davis et al. (1989) mentioned that the objective of the TAM is:

> "to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behaviour across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified"(Davis et al., 1989: 985)

This model was formulated based on the TRA framework. According to Davis (1989), individuals usually tend to accept a technology that they think will help them in doing their jobs. However, if they think the technology is too difficult to be used, they tend to reject the use of such technology. The former is known as *perceived usefulness,* while the latter relates to *perceived ease of use.* Therefore, according to this theory, both factors, *perceived usefulness* and *perceived ease of use,* are considered as key determinant factors in ICT adoption. Figure 3-4 below illustrates this theory in detail.

**Figure 3-4:** Technology Acceptance Model (TAM)




Source: Davis et al. (1989: 985)

Similar to the TRA, this theory also believes that the actual behaviour is highly determined by behavioural intention. However, in this theory behavioural intention is jointly determined by *attitude toward* (A) and *perceived usefulness* (U). The subjective norm is excluded from the model due to "uncertain theoretical" and "psychometric status" (Davis et al., 1989).

This theory also hypothesizes that *attitude toward* (A) is jointly affected by *perceived usefulness,* which refers to the "degree to which a person believes that using a particular system would enhance his or her job performance", and *perceived ease of use*, which refers to "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989: 320). Then, perceived usefulness is jointly determined by external factors and perceived ease of use.

Because this model was specifically developed to explain individual behaviour in computer technology acceptance, this theory has been widely applied in a wide range of IT adoption, such as e-procurement system adoption (Aboelmaged, 2010), e-commerce adoption (Yu and Tao, 2009), ERP implementation (Amoako-Gyampah and Salam, 2004), Internet Banking (Yousafzai et al., 2010), intranet (Alam, 2009) and internet purchasing (Olson and Boyer, 2003). This extensive use of TAM is believed by Yousafzai et al. (2010: 1177-1178) to be due to several inherent advantages :

(a) "It is parsimonious, IT-specific, and designed to provide an adequate explanation and prediction of diverse user population's acceptance of a wide range of systems and technologies within varying organizational and cultural contexts and expertise levels;
(b) it has a strong theoretical base and a well-researched and validated inventory of psychometric measurement scales, making it use operationally appealing; and
(c) it has accumulated strong empirical support for its overall explanatory power"

Yousafzai et al. (2010: 1177-1178)

However, in spite of its advantages, TAM has also been criticized on several issues. Mathieson (1991) argued that the TAM only provides very general information of user opinions about the system. It does not provide an information about "how such perception are formed or how they can be manipulated to foster users' acceptance and increased use" (Yousafzai et al., 2010: 1178). Szajna (1996) was concerned with a validity issue, which is the discriminant validity, of its construct. This is because in TAM, all of its constructs are measured by self reported measurement. As revelaed by Straub, Limayem, and Karahanna-Evaristo

(1995: 1336), “research that has relied on subjective measures for both independent variables, such as perceived usefulness, and dependent variables, such as system usage....may not be uncovering true, significant effect, but mere artifacts”. So that both Straub et al. (1995) and Szajna (1996) argue that TAM has a limitation especially in regard to discriminant validity of its measures.

In addition, El-Gohary (2012) also stated that TAM ignores the effect of several important factors that come from both within and outside of the organization, such as organizational size, organizational culture, cost, and environmental pressure.

### 3.1.4 The Perceived e-Readiness Model (PERM)

The Perceived e-Readiness model (PERM) was introduced by Molla and Licker (2005b). This model was designed for e-commerce adoption by business in developing countries. The reason given by them was that businesses in less developed countries encounter different problems to businesses in developed countries. They are different in both the organizational and environmental context. Hence, in regard to e-commerce adoption, it is not suitable if a model that was originally developed based on business in developed countries is applied for business in developing countries.

In this model, e-commerce adoption by business in developing countries is influenced by two factors, which are *Perceived Organizational e-Readiness (POER)* and *Perceived External e-Readiness (PEER*). In this case, POER refers to:

1. “The organization’s perception, comprehension, and projection of e-commerce and its potential benefits and risk (innovation imperative attributes);
2. The commitment of its managers (managerial imperative attributes);
3. Key organizational components, such as its resources, processes and business infrastructure (organizational imperative attributes)”

(Molla and Licker, 2005b: 879)

Then, PEER refers to assessment and evaluation conducted by the organization in regard to relevant external environmental aspects, which are known as “environmental imperative attributes”,“Government e-readiness”, “market forces

e-readiness", and "support industries e-readiness" are identified as PEER elements. Molla and Licker (2005b) claim that this model can help business in developing countries to locate, measure and manage risk regarding to e-commerce adoption activities.

### 3.1.5 The Innovation Diffusion Theory (IDT)

Different to previous theories, which are more focused on the individual perspective, the innovation diffusion model is more focused on a 'process-oriented' perspective in order to describe how an innovation can be received and dispersed between people (Yu and Tao, 2009). Originally, the Innovation Diffusion (ID) model was developed by Rogers (1983) by using broad psychological and sociological theory.

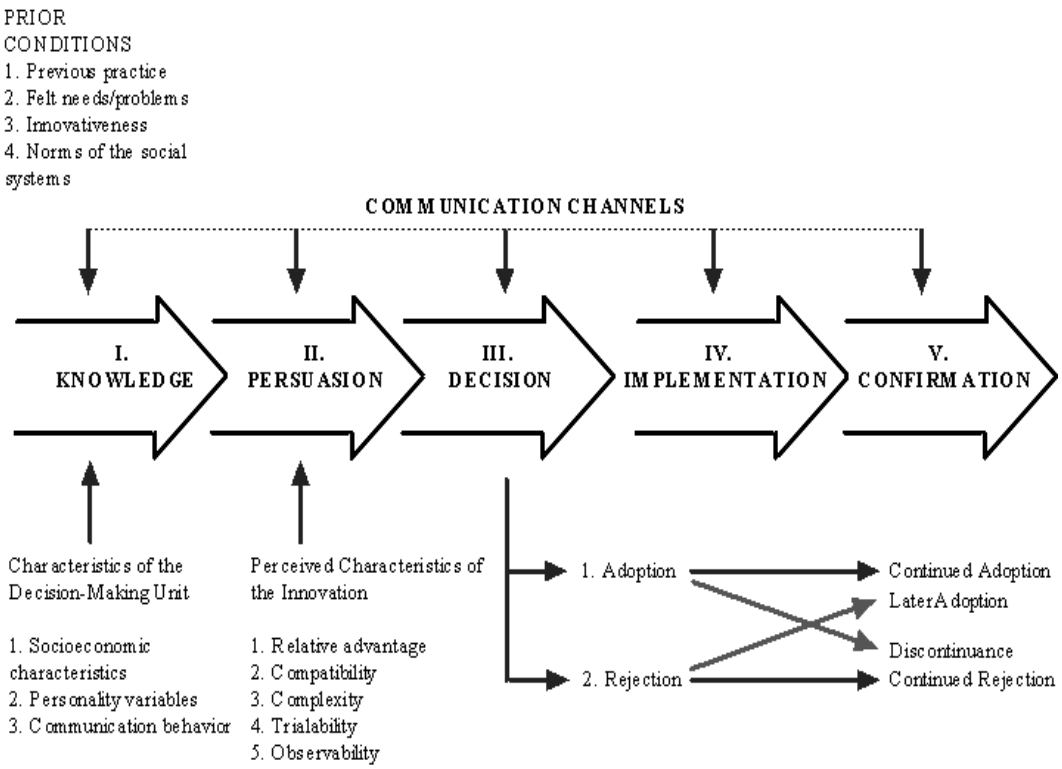
Innovation is defined by Rogers (2003: 12) as "an idea, practice, or object that is perceived to be new by an individual or other unit of adoption". While diffusion refers "the process by which an innovation is communicated through certain channels over time among members of social systems" (Rogers, 2003: 5) In this model, the process of diffusion of new innovation requires four key elements, which are an innovation (something recognized as a new), a communication channel (a means used to spread messages among people), a social system ("a set of interrelated units engaged in joint problem solving to accomplish a common goal"), and time (time needed during the process) (Rogers, 2003: 23).

The decision to adopt, or not to adopt, an innovation is not a simple task and it is also not a spontaneous act. It needs a process called "*the innovation-decision"* process. Rogers (2003) explained the innovation-decision process as

> "...the process through which an individual (or other decision making unit) passes from gaining initial knowledge of an innovation, to forming an attitude toward the innovation, to making decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision" (Rogers, 2003: 168)

This is illustrated in more detail in Figure 3-5 below.

**Figure 3-5:** The Innovation-Decision Process




*Source:* Rogers (2003: 170)

According to this theory the process of diffusion of innovation is preceded by knowledge of the innovation. The knowledge would occur if the individual or other decision-making unit understands about the existence and function of such innovation. Having the knowledge about certain innovation will lead individuals to shape their attitude (positive or negative) toward the innovation. This condition is called by Rogers as the *persuasion* stage. It should be noted that the initial knowledge gathered by individual does not directly lead the individuals to make a decision whether to adopt or not to adopt the innovation. In this stage usually individuals actively find any information about the innovation from their colleagues, peers, teachers, experts, scientific evaluations and others, in order to convince them about the innovation and so to reduce the degree of uncertainty of the innovation. Rogers explained that the individuals tend to use their feelings in this situation, so the advice from other parties will affect individuals feeling and

belief about the innovation considerably. The information gathered is also useful for individual to evaluate the innovation in order to make the decision.

There are two possible decision made by individuals, which are to adopt or reject the innovation. Adoption means "full use of an innovation as the best course of action available", while rejection is "a decision not to adopt an innovation" (Rogers, 2003: 177). Usually, the availability of a trial version of any kind of innovation is more preferred by the individual, and it will be adopted more quickly.

If the decision to adopt has been made, the next stage is the implementation stage. In this stage, the innovation is used in practice. This decision is not the end of the innovation-decision process. Usually, the individuals still seek a support to convince them that the decision they made is the best decision. The decision could be revised if the individual is "exposed to conflicting messages about the innovation" (Rogers, 2003: 189). However, the individual tends to defend their decision by avoiding negative messages and seeking the positive messages. It means in that the individual's attitude plays a significant role in the confirmation stage.

Besides explaining about the process in a making a decision about innovation, the *innovation-decision* process is also believed by Rogers as a process to reduce the uncertainty of innovation (Rogers, 2003: 232). Then, Rogers also proposed five attibutes of innovation that can be used to reduce uncertainty, and it also can affect the speed of innovation adoption. These attibutes are:

a. Relative advantage, which is defined as "the degree to which an innovation is perceived as being better than idea it supersedes" (Rogers, 2003: 229), or "ratio of the expected benefits and the costs of adoption of an innovation" (Rogers, 2003: 233).
b. Compatibility, which is defined "as the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters" (Rogers, 2003: 240).
c. Complexity, which refers to "the degree to which an innovation is perceived as relatively difficult to understand and use" (Rogers, 2003: 257). The more

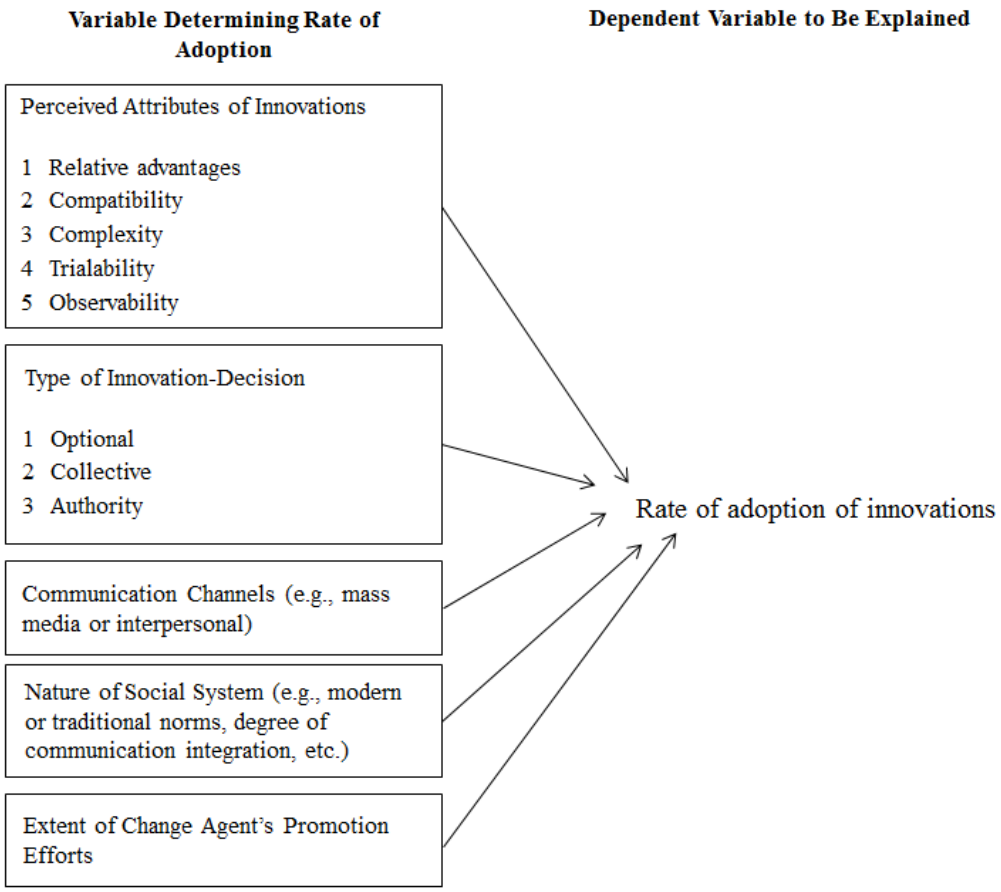
complex of an innovation, the more reluctant the individual use such innovation.

d. Trialability, which pertains to "the degree to which an innovation may be experimented with on limited basis" ( Rogers, 2003:259).
e. Observability, which is "the degree to which the results of an innovation are visible to others" (Rogers, 2003: 258).

In addition to the attribute of innovation, Rogers (2003) also proposed that several variables, namely "type of innovation-decision", "communication channels", "nature of social system" and "extent of change agents' promotion effort", as factors that affect the degree of innovation.

Rogers (2003) summarized the variables determining the rate of adoption of innovation in Figure 3-6 below:

**Figure 3-6:** Determinant Variables of the Rate of Innovation Adoption

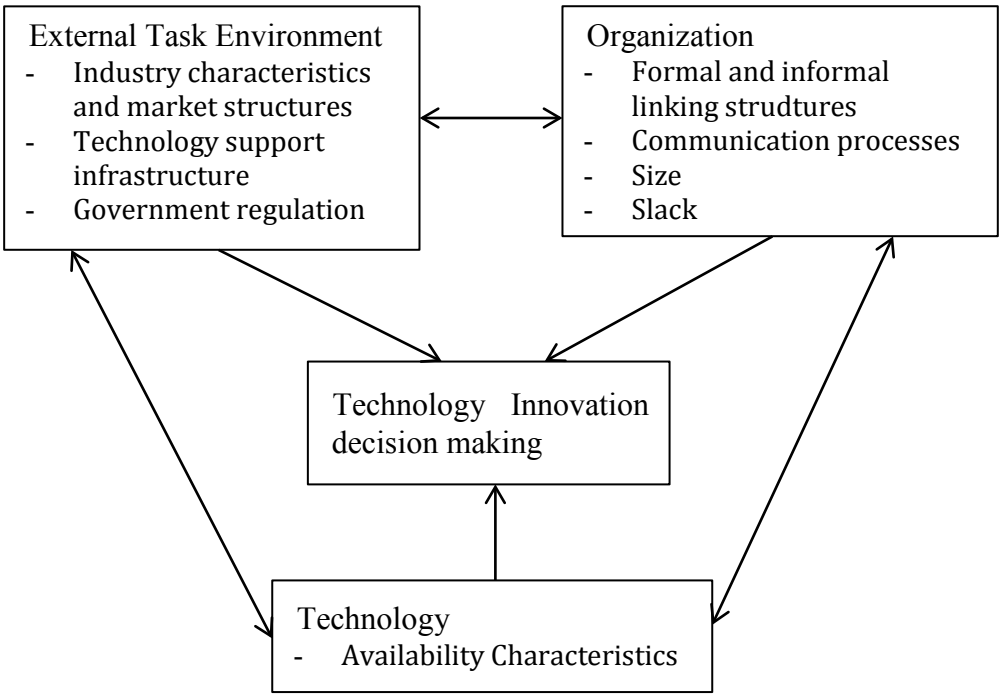



Source: Rogers (2003: 222)

### 3.1.6 The Technology-Organization-Environment (TOE) Framework

The Technology-Organization-Environment (TOE) framework was developed initially by Tornatzky et al. (1990) in order to describe the influence of contextual factors in the adoption of the innovation. In this framework, there are three aspects in a firm's context that influence adoption of the technology innovation, which are technological context, organizational context, and external task environmental (industry) or as it called the environmental context. Technological context relates both to the internal and external technologies that relevant to firm. Organizational context pertains to the nature and the resources of the firm, which is proxied by firm size, the decentralization, formalization, and complexity of managerial structure; while, environmental context refers to other parties in surrounding firm such as competitor, supplier and government (Zhu et al. 2002). Figure 3-7 below is the TOE Framework.

**Figure 3-7:** Technology-Organisation Environement (TOE) framework.




Source: Tornatzky et al. (1990: 40)

### 3.1.7 Resource Based Theory

Resource Based Theory was developed by Barney (1991). According to Rivard et al., (2006), the original piece of work of RBT was found in Penrose (1959), which described the business as a "bundle of resources". In this theory, the business can achieve a sustainable competitive advantages by utilizing and exploiting the various resources from internal or external resource bundles (Parker and Castleman, 2009; Ray and Ray, 2006). According to Rivard, Raymond, and Verreault (2006) the resources consists of assets, capabilities, processes, attributes, knowledge and know-how that are owned by a business, and that can be used to develop and enact competitive strategies.

Two basic assertions underlying this theory are resource heterogeneity, which is that the resources and capabilities owned by business may differ and resource immobility (Mata, Fuerst and Barney, 1995). In this regard, the resources will contribute to the competitive advantage only if the business has the resources that are not owned by another company or are used differently and such advanatge may be long term.

More specifically, Barney (1991) revealed that the resources will contribute to the competitive advantage if they have the following characteristics, which are:

1. Valuable, in which the resources must have strategic value to business;
2. Rare, in which the resources must be unique and difficult to find;
3. Imitability, in which the resources must be difficult to copy; and
4. Non-substitutability, the resources are difficult to substitute by another resources.

In IS literature, this theory is mainly used to explain the contribution of IT to business value. For example, Zhu and Kreamer (2005) apply this theory in order to explain the link relationship between e-business use and business value. Then, Rivard et al., (2006) used this theory in order to explain the contribution of IT to business performance. Similarly, in this study the Resource Based Theory is mainly used in order to link the e-commerce use and SMEs performance.

## 3.2 THE APPLICATION OF THEORY IN E-COMMERCE STUDIES

The theories above have been widely applied in previous technology innovation adoption studies, including e-commerce adoption studies. Several studies applied a single theory and others applied a combination of two or more theories. Baker, Al-Gahtani, and Hubona (2007) tested TPB in the context of new technology implementation by private and public sector organizations in Saudi Arabia. Using the survey method, 310 private sector and 778 public sector organizations participated in this study. This study found that attitude toward, subjective norm and perceived behaviour control were determinant factors on intention to use information technology. Then, Nasco, Toledo and Mykytyn Jr. (2008) applied this theory in the context of e-commerce adoption by SMEs in Chile. Consistent with a previous study, based on a survey of 212 SMEs in Chile, they found that attitude and subjective norm were significant factors that affect intention of SMEs' owner/manager in adoption of e-commerce.

Amoako-Gyampah and Salam (2004) applied TAM in a study of ERP implementation in large global organization in the US. A survey method was adopted with 409 employees as respondents. This study found that project communication and training affect belief in the benefits of ERP system and this belief affects both perceived usefulness and perceived ease of use. Then, TAM was also tested by Yu and Tao (2009) in a study of e-market place adoption by large companies in Taiwan. Two hundred and two managers of large companies participated in this study and it was found that at the pre-adoption stage, attitudes of businesses were influenced by perceived usefulness, perceived ease of use, subjective norm, and business characteristics; however, at the decision stage, attitudes were only influenced by perceived usefulness and subjective norm.

In the context of e-commerce adoption, TAM was applied by Grandon and Pearson (2004a). In this study 100 SME owner/manager in the US participated, and they found that perceived usefulness, perceived ease of use, compatibility and external pressure as determinant factor in e-commerce adoption. In a similar way,

Saffu, Walker, and Hinson (2008) also applied TAM in order to investigate determinant factors of e-commerce adoption by SMEs in Ghana, West Africa. Consistent with Grandon and Pearson (2004), this study also found that perceived usefulness, compatibility, external pressure and organizational pressure as determinant factors of e-commerce adoption.

Besides having applied TAM and TPB separately, studies that apply a combination of them have also found. For example, Riemenschneider, Harrison, and Mykytyn Jr (2003) applied a combination of TAM and TPB to study factors that influenced small business executives in making decisions regarding adoption of the web. In their study, it was found that improved social contacts with customers and suppliers as factors that encourage small business executive in adopting of the website. More importantly, this study also found that the combination of TAM and TPB provided a better fit than either TAM or TPB alone. Then, Aboelmaged (2010) also applied the combination of TAM and TPB in order to investigate influencing factors on the intention of e-procurement system use on businesses in the United Arab Emirates. In this study, attitude, perceived usefulness, subjective norm, behaviour control were found as determinant factors on the intention of e-procurement system use; and ease of use as a predictor of both attitude and usefulness.

The combination of TAM and TPB was also found in Quaddus and Hofmeyer (2007). Yet, in this study both theories was also combined with IDT. By using small businesses in Western Australia as a sample, this study found vendor support as a main predictor of awareness, and the awareness significantly influenced perceived benefits (both direct and indirect), then these benefits significantly influenced attitude. The attitude also influenced an intention to adopt a B2B trading exchange. The attitude was also affected by critical mass and organizational characteristics.

It cannot be denied that the TPB, the TAM or the combination of TPB and TAM is included in the theory that are frequently used in research related to the adoption of an innovation (Wymer and Regan, 2005). It was mentioned by Parker

and Castleman (2009) that the strength of them are because they are developed to measure and predict bahaviour in the near future. Yu and Tao (2009: 95) revealed that "the beauty of TAM is it is simple and effective". In addition, TAM is also considered as a parsimonious model, strong in theoretical base and supported by strong empirical research (Yousafzai et al., 2010).

In spite of these advantages, however, some criticisms are addressed to both theories. TPB was criticized by Yousafzai et al. (2010), Davies et al. (2002) in regard to its predictive power. The predictive power of the TPB is weak if it applied in the situation in which intention and behaviour are highly correlated. This model also ignores, or does not include, several factors that are considered able to increased the predictive power of this model, such as personal norm and affective evaluation of behaviour (Yousafzai et al., 2010). TAM was criticized regarding to its generality (Taylor & Tod, 1995); validity of its constructs (Szajna, 1996); and ignoring other factors that come from within and outside organization (El-Gohary, 2012); and personal behavioural factors (Taylor & Tod, 1995). Then, Mathieson (1991) mentioned that the TAM only provides very general information of user opinions about the system. It does not provide an information about "how such perception are formed or how they can be manipulated to foster users' acceptance and increased use" (Yousafzai et al., 2010: 1178).

More importantly, both TAM and TPB are recognized as a theories that focus on an individual perspective. The application of TAM or TPB in the study of e-commerce adoption by SME is considered unable to capture the complexity in which owner/manager's perspective are forged (Parker and Castleman, 2009). These theories ignore SMEs idiosyncrasies and they also ignore the role of other parties, such as employees, family, government support, and trading partners, in influencing decision made by individual manager/owner (Parker and Castleman, 2009). As described in a previous chapter, the SME is different to large businesses, and they are unique. In regard to the decision making process in SMEs, family members, employees, trading partners, support from goverment,

business network, industry organization and service provides can influence decisions made by the SME owner/manager. Both TPB and TAM assumed that the influences of these parties on intention are distinct, in fact the influences of them are intercorrelated (Parker and Castleman, 2009). So that, it seems that the TPB and TAM are unable to capture the idiosyncrasies of SMEs.

Therefore, based on the explanation above, the TPB and TAM are not applied in this study. It is because to study SMEs, a theory that is able to explain their idisyncrasies is needed rather than the individual perspective theories such as the TPB and TAM.

To sum up, in this study the TPB and TAM are not applied because of the following reasons:

1. Both TPB and TAM are focused on the individual behaviour however both are unable to capture the complexity in which the owner/manager's perspective are forged (Parker and Castleman, 2009).
2. Both TPB and TAM assume that the decision making process in SMEs is highly determined by SME's owner and they ignore the influence of other parties, such as family members, employees, government support, and trading partners in decision making process. In fact, the influence of such parties in decision making process is also important.

Another model applied in previous studies is the Perceived e-Readiness Model (PERM). Molla and Licker (2005b) developed and applied this model in order to investigate influencing factors of e-commerce adoption by business in developing countries. In this study, Perceived Organizational E-Readiness (POER), which is measured by awareness, human resources, business resources, technology resources, commitment, and governance, and Perceived External E-Readiness (PEER), which consists of government e-readiness, market forces e-readiness and support industries e-readiness, are found as determinant factors of e-commerce adoption by business in South Africa. Then, Tan et al. (2007) tested this model in context of B2B adoption by Chinese SMEs. One hundred and thirty four SMEs participated in this study and it was found that Perceived Organizational e-

Readiness and social-cultural factors were the main inhibitors in e-commerce adoption and diffusion in China. According to Molla and Licker (2005b), this model is suitable when applied to the developing countries context, because it was developed to take into account factors contextual to those countries. However, this model was also criticized by Tan et al. (2007) in regard to its validity and reliability, its statistical analysis and that it ignored important industry descriptors (for example, firm size and educational background of employees). In addition, PERM places more emphasis on organizational characteristics and it does not consider the influence of individual factors in e-commerce adoption. As we know, in small business the role of owner/manager in decision making is very influential. So, this model is also unable to capture the idiosyncrasies of small business (Parker and Castleman, 2009). Therefore, this model is not applied in this study.

The Innovation Diffusion Theory (IDT) is considered by several authors as one of theories most frequently used in innovation diffusion studies, especially IT technology (Ghobakhloo and Tang, 2013; Sila, 2013), even though this theory was not intended to be applied to this technology in particular (Parker and Castleman, 2009). One of studies that applied this theory is Iacovou et al. (1995). They applied the Innovation of Diffusion Theory (IDT) in regard to investigating the factors that influence small business in adopting Electronic Data Interchange (EDI). They proposed perceived benefits, organizational readiness and external pressure as factors that influence small business in adoption of EDI. By using face to face and structured interviews with high level managers in seven companies in British Colombia, Canada, they found that there was positive relationship between perceived benefits and EDI adoption; that the relationship between organizational readiness and EDI adoption was not very strong; and external pressure was a significant factor in EDI adoption. Similar work by Chwelos, Benbasat, and Dexter (2001), based on a survey 337 SMEs managers in Canada, found that perceived benefits, external pressure and organizational readiness have a positive relationship to the intention of EDI adoption. They also found that the last two factors were the most important factors on intention of EDI adoption.

Besides EDI adoption, IDT was also used in various IT innovation adoption studies, such as Web presence, (Beatty, Shim, and Jones, 2001; Raymond, 2001); internet based ICT (Tan et al., 2009); e-marketing (El-Gohary, 2012); e-business (Lin and Lin, 2008; Hsu, Kraemer, and Dunkle, 2006); e-SCM (Supply Chain Management) by Wu and Chuang (2010), Information systems (Thong, 1999); Enterprise Resource Planning (ERP) (Bradford and Florin, 2003); and Customer Relationship Management (CRM) (Nguyen and Waring, 2013). From these studies, perceived benefit was found consistently as a determinant factors in adoption.

IDT was also used to explain the adoption of e-commerce in companies. Looi (2005) conducted a study that aimed to identify factors that encouraged SMEs in Brunei in the adoption of e-commerce. Through a survey of 184 SMEs in Brunei, it was found that relative advantage, IT knowledge, competitive pressure, government support and security as determinant factors in adoption of e-commerce by the SME in Brunei. Al-Qirim (2005) adapted the IDT in order to investigate influencing factors of e-commerce adoption by SMEs in New Zealand. One hundred and twenty nine SMEs were surveyed and it was found that firm size, compatibility, CEO innovativeness and support from technology vendorsas determinant factors in various e-commerce technologies adoption. Then, Chong (2006) also adapted the IDT in study of e-commerce adoption by SME in Australia. In this study, perceived relative advantage, observability, trialability, variety of information sources, communication amount, competitive pressure, and non-trading institutional influences were found as the factors that influence the extent of e-commerce deployment in SMEs in Australia. In line with this, Alam et al. (2011) investigated the impact of six factors: relative advantage, compatibility, organizational readiness, security, manager characteristic, and perceive ease of use, to the likelihood of Malaysian SMEs in adoption of e-commerce. Based on a survey of 200 SME in Malaysia, they found the first five factors have a significant impact on e-commerce adoption.

As described previously, IDT is different to TRA, TPB or TAM. The TRA, TPB and TAM are theories that are more focused on the individual perspective, while IDT emphasizes a 'process-oriented' perspective. As theories focused on process, they are certainly relevant to be applied to both the individual or organizational innovation decision-making process. As suggested by previous studies individual decision making process is more relevant for SME than organisational innovation decision making process (Parker and Castleman, 2009; Raymond, 2001), because the innovation decision in an SME is often determined by the owners, as the dominant decision makers. In addition to this, the influence of interpersonal and social context in the decision making process is also considered in IDT. While this theory seems to provide a useful framework to study e-commerce adoption by SMEs, however, according to Parker and Castleman (2009), this theory still has limitations if it is applied alone in small business studies. The limitations of the IDT mentioned by Parker and Castleman (2009) are that this theory does not adequately:

- "explain the issues and dynamics involved whereby small firms are part of a multiple social system.....with possibly condradictory norms, behaviours and beliefs. The theory does not provide a lens through which to examine these complex social and rational dimensions
- account for the disparate change agents..., how their roles differ, and the interrelationships between change agents as well as with small firm themselves".

(Parker and Castleman, 2009: 174)

Therefore, it is suggested by Parker and Castleman (2009) that the IDT should be combined with other theory(ies) to be able to form an integrated theoretical framework to study e-commerce adoption by SMEs. Based on this explanation, in this study the IDT is applied, yet because of the weaknesses of IDT as mentioned by Parker and Castleman above, the application of the IDT in this study will be combined with another theory.

Another theory that is one of the most frequently used in IT adoption studies is the Technological, Organizational and Environmental (TOE) framework (Sila, 2013; Tan et al., 2007). This framework has been applied widely in IT adoption

studies. For example, Zhu, Kraemer, and Xu (2002) conducted cross country studies to identify factors that influence the adoption e-business in eight European countries. They applied the TOE framework, and they found that technology competence, firm scope and size, customers readiness and competitive pressure were discriminant factors in adoption of e-business. Kuan and Chau (2001) tested this model in regard to EDI adoption by small business in Hong Kong. They proposed that technology factors, such as perceived direct benefits and perceived indirect benefits; organizational factors, such as perceived financial cost, and perceived technical competence; and environmental factors, such as perceived industry pressure and perceived government pressure have positive relationship with EDI adoption. From their 575 SME respondents, they found all the factors they proposed, except perceived indirect benefits, had a significant relationship with EDI adoption.

The TOE framework was also applied in various technology innovation adoption studies, for example on Radio Frequency Identification (RFID) adoption (Li, Wang, Zhang, and Chu, 2010); web 2.0 adoption (Saldanha and Krishnan, 2012); enterprise systems such as ERP, CRM, SCM and e-procurement (Ramdani, Chevers, and Williams, 2013; Ramdani, Kawalek, and Lorenzo, 2009); and e-market (Duan et al., 2012). These studies proposed various technological, organizational and environmental factors. Some of technological factors proposed in these studies were relative advantages, compatibility, complexity, triability, observability, cost, and technology competence. Whilst, top management support, organizational readiness, IS experience, firm size, firm scope, IS usage, and professional of IS unit were proposed by these studies as organizational factors. Several environmental factors such as external pressure, perceived industry pressure, perceived government pressure, customers pressure, vendor support, lack of trading partner readiness, competitive pressure, industry knowledge intensity, and market scope were proposed by these studies. Most of the factors mentioned above were found as determinant factors in adoption of technologies.

TOE was also widely applied in regard to e-commerce adoption. Several studies have also tested this framework in regard to e-commerce adoption by small business in several countries. Le, Rowe, Truex, and Huynh (2012) tested the TOE framework on SMEs in Vietnam and 926 SMEs participated in this study. Eleven factors regarding technological (compatibility, complexity, perceived risk), organizational (organizational readiness, size, employee's knowledge) and environmental (the perception of professional industry association support, governmental support, and perceives pressure form buyer and supplier) along with factors related to manager attitude were found as determinant factors in e-commerce adoption by these SMEs. In line with this, Sila (2013) also found that most of technological, organizational and environmental (TOE) factors proposed in his study have a significant relationship on the extent of B2B e-commerce usage by SMEs in North America. Morteza et al. (2011) also found that technological factors: perceived relative advantages, perceived compatibility; organizational factors: information intensity, CEO's innovativeness, size; and environmental factors: competitive pressure, support from technology vendor, as determinant factors in e-commerce adoption decision making in Iranian SMEs.

The explanation above shows that the TOE considers three aspects of an organization, which are: technological, organizational and environmental aspects, that influence e-commerce adoption by organization. In this regard, the TOE assumes that the changes in organization are determined not only by individuals in organization but it also determined by characteristics of organization in which they operate. In addition to this, the TOE is also recognized as the interactive process perspective that allows the researchers to treat all of the factors and their interaction in one dynamic framework (Molla and Licker, 2005a).

So it is considered a comprehensive tool (Ghobakhloo and Tang, 2013; Duan et al., 2012); a useful framework (Kuan and Chau, 2001); and a valuable framework (Tiago and Maria, 2010), for studying technology adoption in organizations, including SMEs. It is also a popular model for studies related to technology adoption issues (Morteza et al., 2011; Salwani et al., 2009). Then, Ramdani et al.

(2013) also argue that TOE is a robust model for predicting e-commerce adoption by the SME.

In spite of positive opinions given for the TOE, however Ghobakhloo and Tang (2013) criticized this model because it ignores factors that are related to individual attributes, such as employees and manager attributes. However, if TOE is combined with a theory that consider such attributes, such as IDT, it could provides a better framework to study e-commerce adoption in SMEs.

Therefore, in this study *the combination of IDT and TOE is used*. To be more explicit, the reason to combine the IDT and TOE in this study are:

1. The IDT relies on a process oriented perspective that relevant to be applied to both the individual or organizational innovation decision making process.
2. The IDT has considera not only the influence of interpersonal but also the influence of social context in the decision making process. As previously described, the innovation decision making process in SME is unique. This process is not only determined by the individual owner, but is also influenced by other parties such as family members, employees, trading partner, and government support. So this can capture this condition.
3. Even though the IDT is able to capture the idiosyncrasies of the SME, however it still does not adequately explain the issues and dynamics involved whereby small firms are part of a multiple social system that could have contradictory norms, behaviours and beliefs, and this does not provide a lens through which to examine these complex social and rational dimensions. Thus, the use of only this single theory in study of SMEs would not be able to address that issue. To be able to form an integrated theoretical framework to study e-commerce in SMEs, this model needs to be combined with other theory.
4. The TOE is a theory that consider three important aspects in organization, which are technological aspects, organizational aspects and environmental aspects, as factors that determined the adoption of technology innovation. This theory allows the researcher to treat all of the factors and their interaction

in one dynamic framework. It is believed that this theory will able to balance out the weaknesses of the IDT. Therefore, the combination of the TOE and IDT will provide an integrated framework to study e-commerce adoptio by SMEs.

The combination of the TOE and IDT has been found widely in study of e-commerce adoption by SMEs. According to extensive literature review conducted by Hameed et al. (2012), they found that TOE was more often combined with IDT than other models. This is because TOE is consistent with the IDT (Sila and Dobni, 2012; Morteza et al., 2011; Hsu et al., 2006; Zhu et al., 2006) and they complement each other.

Several studies that use this combination are Al-Qirim (2005, 2007), Ghobakhloo and Tang (2013), Thong (1999), Hsu et al. (2006) and Lin and Lin (2008). In the Al-Qirim (2005, 2007) studies, the combination of TOE and IDT was used in order to investigate the factors that influence SME in the adoption of e-commerce. In this study, Al-Qirim proposed ten factors: relative advantage, cost, compatibility, size, information intensity of product, competition, buyer/supplier pressure, support from technology vendor, CEO's innovativeness, and CEO's involvement, that influence Australian SMEs in their adoption of e-commerce technologies. By using a survey method, based on responses from 129 respondents, it was found that CEO innovativeness was a significant factor in term of external email; CEO involvement was a significant factor for intranet adoption; support from technology vendors, relative advantage and competition as factors that influence extranet/VPN adoption; information intensity and CEO innovativeness as significant factors in web sites adoption; whilst cost and compatibility did not play any significant role in EC adoption. Then, a combination of TOE and IDT was also applied by Ghobakhloo and Tang (2013) in order to identify influencing factors of e-commerce adoption by SMEs in Iran. This study also used a survey method with 268 SMEs owner/managers as respondents. This study found that perceived benefits, perceived compatibility, perceived risk, perceived cost and innovativeness as determinant factors in

adoption of e-commerce by SMEs in Iran. This result is consistent with previous studies conducted by Thong (1999), Hsu et al. (2006) and Lin and Lin (2008).

## 3.3 REVIEW OF E-COMMERCE ADOPTION STUDIES

As seen in the previous subsection, there have many been studies conducted with regard to e-commerce adoption by business. A review of these studies will be carried out by grouping them into five perspectives. Firstly, these studies can be grouped based on where the study was conducted; whether in developed countries or developing countries. Based on an extensive review of 345 papers related to IT innovation adoption studies, published in nineteen peer-reviewed journals between 1985 to 2007, conducted by Williams et al. (2009), it was found that 82.7% of these studies were conducted in developed countries, and only 17.3% of studies conducted in developing countries. A similar condition is also seen on EC studies, Kurnia, Choudrie, et al. (2015) revealed that existing literature still focused largely on developed countries. Over the past few years, there have started to be e-commerce studies conducted in developing countries, although mainly for certain countries in Africa, Arab countries, and China.

As commonly known, there is a different between countries, not only between developing countries and developed countries, but also among developing countries or among developed countries. As described in Chapter One, developed countries are very different to developing countries in terms of political, social, culture, legal and infrastructure issues. These differences will limit the applicability of innovation technology, including e-commerce technology, which were originally created based on developed countries condition to developing countries condition (Kartiwi and MacGregor, 2008; Tan et al., 2007). Then political, social, culture, legal and infrastructure differences has also occured among developing countries, although as not big as between developing countries and developed countries. Hence it could also be reasoned that the reseach finding obtained in certain developing countries cannot be generalized into other developing countries.

Lack of EC studies that focus on developing countries certainly provides an opportunity for researchers. Therefore, to fill this gap, this research is conducted in a developing country, in this case Indonesia. The reasons for choosing Indonesia was explained in detail in the previous chapter.

Secondly, studies of technology adoption can also be grouped into two groups based on the object of studies, whether it was conducted on large business or on the SME. According to Daniel and Grimshaw (2002), most studies conducted in the e-commerce domain focused on large businesses, and fewer studies have been conducted in the SME context. This opinion is supported by Parker and Castleman (2007). Their extensive search of fifty-one journals published between 2003 to 2006 found only 120 papers concerning of e-business/e-commerce adoption in SMEs.

Large business is not just a big version of small business, or vice versa. They are different not only because of size but they are also different in many aspects. According to Kartiwi and MacGregor (2008), there are at least four features that distinguish them, which are related to management; the decision making and planning process; resource availability; product/services and markets; and features related to risk taking and dealing with uncertainty. Some examples relating to these features are that SMEs tend to centralize with short term planning perspective; lack of management and business skills; lack of resources; have inadequate planning; a lack of technical knowledge; limited market share; narrow product focus; are facing more uncertainty; are more reluctant in taking risk; and then the SME is considered more risky than large businesses. This suggests that SMEs cannot easily implement the strategies or policies applied by large businesses, including e-commerce technology which was initially developed to fulfil the needed of large businesses in developed countries. On the other hand, because the SME is recognized as a motor of economic growth in many countries, especially in developing countries (Ghobakhloo & Tang, 2013) and their success will have a direct impact to the national economy (Poon and Swatman, 1999: 9) therefore as described in the previous chapter, many parties make a great efforts

to encourage SMEs to implement e-commerce in order to ensure their survival in the competitive global market place.

The limited numbers of studies and a great effort from many parties to encourage SMEs to adopt e-commerce is an opportunity for researchers to conduct studies that relate to e-commerce adoption in SME, especially in developing countries. Therefore, this study aimed to fill this gap through conducting a study related to e-commerce adoption by SMEs in a developing countries.

Next, e-commerce studies can also be classified into two main groups based on issues raised in that study, which are upstream studies and downstream studies (Molla and Heeks, 2007). The former refers to the studies which tend to see the factors that facilitate, or barriers faced, in regard to e-commerce adoption. The latter, on the other hand, refers to the studies which tend to see a post adoption benefits. Studies conducted by Kurnia, Choudrie, et al. (2015), Baridam and Nwibere (2015), Chiliya et al. (2011), Alam et al. (2011), Tan et al. (2007), Raymond (2001), Grandon and Pearson (2004b), Saffu et al. (2008), Quaddus and Hofmeyer (2007), Aboelmaged (2010), Al-Qirim (2007), Govindaraju et al. (2012) and others are a few examples of upstream studies. While, research conducted by Abebe (2014), Molla and Heeks (2007), Sila and Dobni (2012) and Mustaffa and Beaumont (2004) are classified into downstream studies. From this point, it can be seen that most previous studies tend to focus on upstream issues rather than downstream issues and this is also supported by Abebe (2014), Molla and Heeks (2007) and Zhu and Kraemer (2005). Knowing the factors that encourage or inhibit business, particularly for the SME, are important, but understanding how the adoption of e-commerce are beneficial for business performance is also equally important. Salwani et al. (2009) offered several main reasons why SMEs were still reluctant to adopt e-commerce technology as: the lack of success stories; not having knowledge in e-commerce; and a lack of information about the potential impact of e-commerce implementation on business performance. These reasons make SMEs, especially in developing countries, fearful to invest their resources in this technology. In order to fill a

research gap and to give comprehensive understanding about e-commerce in both issues, upstream and downstream issues, therefore this study is not only investigates the factors that influence SME in developing countries in adopting of e-commerce, but it also investigates the impact of it on SME performance.

Then, technology innovation studies can also be classified based on their level of analysis (Hameed et al., 2012; Quaddus and Hofmeyer, 2007; Premkumar, 2003; Frambach and Schillewaert, 2002). Hameed et al. (2012) classified into three broad levels; individual, group and organizational level, while Premkumar (2003), Frambach and Schillewaert (2002) and Quaddus and Hofmeyer (2007) classified these studies into two main levels: individual level and organizational level. Individual level studies focus on individual behaviour in regard to innovation adoption; while organizational level studies, on the other hand, focus on factors that facilitate or hinder an organization in the adoption of innovation and the impact of it on overall organizational performance (Hameed et al., 2012). Among the theories that were explained in the previous section, some of them are associated with either individual level or organizational level, and some of them can be applied on both individual and organizational level analysis. TRA, TPB and TAM are highly associated with individual level analysis; TOE and PERM are associated with organizational level analysis, while IDT can be applied as both individual and organizational level analysis.

Based on an extensive review of 151 studies conducted by Hameed et al. (2012), it was found that most previous studies were conducted at an organizational level, only a few of studies being conducted at an individual level. This is reasonable, because IT innovation adoption in organizations cannot only be associated with one individual because it will involves a lot of people. As explained by Premkumar and Roberts (1999) the decisions made to adopt or reject IT innovation in organizations are made by a consensus of people who are in the organization or handed over to a few people with appropriate authority. Even though the decisions are made by consensus among individuals within organization, however it is not suggested to aggregate the individual perspective

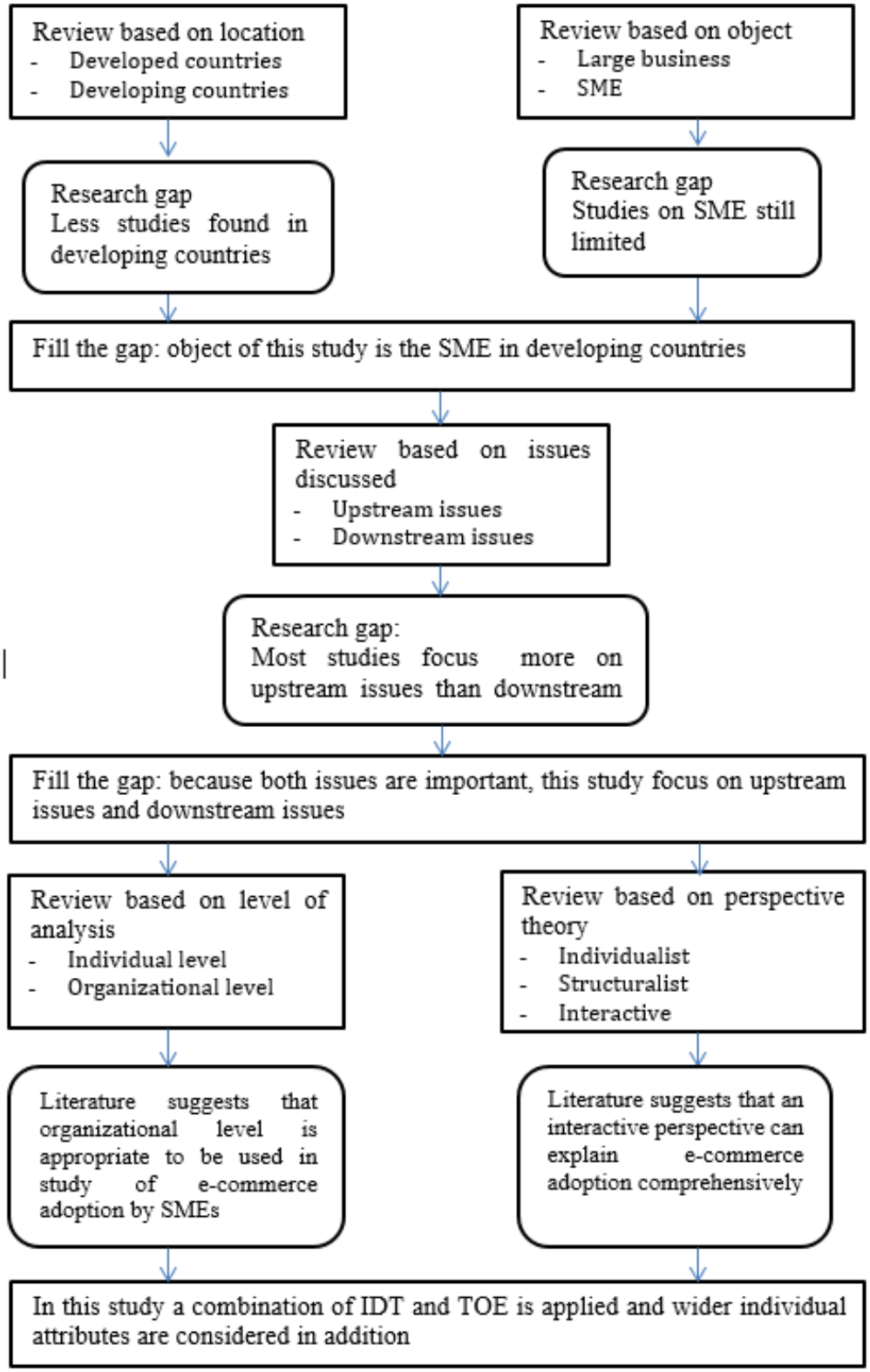
to obtain a picture of organizational level. This condition will cause an aggregation bias, diminished predictive power and it can also lead to over or under-estimation in the results (Hameed et al., 2012). In addition to this, as described in a previous sub section, the use of individual perspective theory in the study of e-commerce adoption by SMEs is unable to capture the idiosyncrasies of SMEs (Parker and Castleman, 2009), and it is suggested to use organizational level analysis to explain IT innovation adoption, such as e-commerce, in organizations. Therefore, organizational level analysis is used in the study to explain the adoption of e-commerce by SMEs in Indonesia.

Furthermore, innovation studies can also be classified based on the perspective used, which are the individualist, structuralist and interactive process perspective (Hameed et al., 2012). An Individualist assumes that a major sources of change in organizations are individuals who are in the organization, so that an individualist study only focused on the action taken by individuals and ignoring characteristics of the contexts in which they work (Hameed et al., 2012). A structuralist, on the other hand, presumes that the changes in organization are highly determined by organizational characteristics, so that contributions of individuals are not considered in structuralist studies (Hameed et al., 2012). Neither individualist nor structuralist alone will see a comprehensive process in the adoption of innovation in organization. In contrast to these perspectives, the last perspective, namely the interactive process perspective, assumes the changes in organization are determined not only by individuals in organization but it also determined by characteristics of organization in which they operate. This perspective allows the researcher to treat all of the factors and their interaction in one dynamic framework (Molla and Licker, 2005a) and it is believed can explain the IT innovation adoption comprehensively. Therefore, in order to explain the adoption of e-commerce by SME in Indonesia thoroughly, this perspective is used. Among theories described above, the TOE is considered as a theory that use an interactive perspective, because it encompasses various contexts (Sila and Dobni, 2012), which are technological, organizational and environmental context. In addition to this, because TOE is consistent with IDT, and the IDT offers a

useful framework to study e-commerce in the SME, therefore the combination of the TOE and IDT is applied in this study. Moreover, because the TOE is criticized for ignoring factors related to individual attributes, such as manager attributes (Ghobakhloo and Tang, 2013), this study also considers the individual factors (in this case the SME owner/manager), as determinant factors in adoption of e-commerce by SME in Indonesia.

To sum up, the review of e-commerce adoption studies above is described in Figure 3-9 below.

**Figure 3-9:** Summary for Review of E-commerce Studies



Based on the explanation above, to investigate the factors that influence the adoption of e-commerce by SME in Indonesia, a combination of TOE and IDT is applied. In the TOE framework, influencing factors of e-commerce adoption can be classified into three main contexts, which are technological, organizational and environmental context. Besides these contexts, there is one context added in this study, which is the individual context. This context is considered in this study because mostly the SMEs in Indonesia are often an owner-manager business, in which the owner, manager or employer are the same person, and the decision to adopt e-commerce is mostly determined by factors related to that individual, such as their innovativeness, their involvement in the adoption process and their IT knowledge.

Therefore, in this study four main contexts are considered as factors that influence the SME in Indonesia in adopting of e-commerce. Details of these are presented in the following sub section.

### 3.3.1 Technological Context

According to Tornatzky et al. (1990) the technology context describes not only existing technology available within an organization but also new technology available in the market which determines the ability of organization to move to new technology or other technologies initiatives. In this study, the technology context refers to technology aspects such as perceived benefit, compatibility, and cost, which influence business in the adoption of e-commerce technology. Several previous studies found that these aspects were significant determinants in e-commerce adoption (Duan et al., 2012; Morteza et al., 2011; Shah Alam, Ali, and Mohd. Jani, 2011; Tan et al., 2009; Al-Qirim, 2008; Saffu et al., 2008; Iacovou et al., 1995)

#### *3.3.1.1 Perceived Benefits*

Perceived benefit refers to the degree of acceptance of the possible advantages that e-commerce technology can provide for the organization (Tiago and Maria,

2010; Iacovou et al., 1995) Literatures record that there are so many advantages offered by e-commerce technology, some of them are to reduce cost, reduce time processing, increase productivity, expand market share, and increased productivity (Turban et al, 2010). Greater managerial understanding of the relative advantages of e-commerce adoption raises the probabilities to allocate some resources, such as managerial resources, financial resources and technological resources, in adoption of e-commerce technology (Tiago and Maria, 2010; Iacovou et al., 1995). Conversely, the lack of understanding by the owner/managers about the benefits of e-commerce made them hesitant and reluctant to adopt e-commerce (Kapurubandara and Lawson, 2006). Duan et al. (2012) mentioned that an organization will adopt technology if they perceived that the technology needed will overcome a perceived performance gap or enable a business opportunity. Several previous studies found that the perceived benefits have a positive correlation with the technology adoption (Abou-Shouk, Megicks, and Lim, 2013; Ghobakhloo and Tang, 2013; Alam et al., 2011; Morteza et al., 2011; Tiago and Maria, 2010; Tan et al., 2009; Al-Qirim, 2007). These explanations lead to the following hypothesis:

H1. Perceived benefits positively influence the adoption of e-commerce by the SME

#### *3.3.1.2 Compatibility*

Compatibility refers to what extent e-commerce is compatible with the technology infrastructure, culture, value, and work practices that already exist in the firm (Morteza et al., 2011). An innovation will be easily accepted in an organization if it is tune in with the prevailing values in an organization, can meet the needs of the organization and is in accordance with their organization culture. Compatibility between organization policies with technology innovation will make the innovation easier to be pictured in a more familiar context (Rogers, 2003). The compatibility is also associated to a preceding idea and this compatibility can either speed up or slow down the adoption of innovation by organization (Alam et al., 2011). In addition, compatibility is related to the degree

that the innovation meets end user client needs, if that the client feelst the innovation meets their need, usually the speed of innovation adoption becomes faster (Rogers, 2003). Rogers even mentions that if the innovation is deemed by organization irrelevant to their client needs, even though the innovation looks technically and financially better in performing a certain task, it may not be adopted even if it produced a better quality outcome (Rogers, 2003). Therefore, in this study compatibility is proposed as an important factor that influences the SME in the adoption of e-commerce. Several previous studies, such as Beatty et al. (2001), Grandon and Pearson (2004), Hong and Zhu (2006), Saffu et al. (2008), Tan et al. (2009),Alam et al. (2011), Gilaninia, Danesh, Amiri, Mousavian, and Eskandarpour (2011), Le et al. (2012) and El-Gohary (2012), found that compatibility has a positive relationship with e-commerce adoption. Thus, in this research it is hypothesized that:

H2: Compatibility positively influences the adoption of e-commerce by the SME

#### *3.3.1.3 Cost*

Adopting e-commerce technology in an organization requires some technology infrastructures, such as hardware, software, internet network and IT personnel. As commonly known, those infrastructures are quite expensive for organizations, especially for small business. The cost spend for certain technology will affect the speed of adoption and implementation. The less the cost spend on a certain technology, the more likely it will be quickly adopted and implemented in an organization (Premkumar and Roberts, 1999; Tornatzky and Klein, 1982). Although mentioned by Palvia, Means Jr. and Jackson (1994) that the prices of hardware and software have decreased rapidly due to the emergence of powerful personal computers and the availability of software packages which are user friendly and ready to use, however, that cost remains an obstacle for SMEs in adopting certain technologies (Wymer and Regan, 2005; Premkumar and Roberts, 1999). Therefore, in this research the cost is considered as one of determinant factor for SMEs in the adoption of e-commerce. Some studies, such as Sila (2013), Wymer and Regan (2005) and Alam (2009) found that the cost is a

significant factor in adoption of e-commerce by SME. These explanations lead to the following hypothesis:

H3: Cost negatively influences the adoption of e-commerce by the SME

### 3.3.2 Organizational Context

As previously explained organizational context refers to the characteristics of the firm that might influence the adoption of innovation technology, in this instance, e-commerce technology. Technology readiness and the size of business which are the organizational context factors were identified as factors that could affect Indonesian SMEs in adopting e-commerce.

#### *3.3.2.1 Technology Readiness*

Technological readiness is defined as the extent to which the technology infrastructure, relevant system and technical skills in business which can support e-commerce adoption (Zhu et al., 2006). Previous studies recognized that technology resources are one of factors determined in IS success (Zain, Rose, Abdullah, and Masrom, 2005; Zhu and Kraemer, 2005). Technology readiness consists of technology infrastructure and IT human resources (Zhu and Kraemer, 2005) and both are really needed if the company wants to make e-business an integral part of the value chain (Tiago and Maria, 2010). The former refers to all IT infrastructures, such as computer hardware and software, network, databases, and communication capabilities, that enable internet-related business, while the latter associates with the understanding and skills of IT employees in regard to implemention of the application (Zhu and Kraemer, 2005). It was mentioned by Tiago and Maria (2010) that companies that do not have a strong technology infrastructure, and does not have sufficient IT skills may not be willing to bear the risk of adoption of e-business and conversely those who have both had a great position to adopt e-business. Even more, Teo and Ranganathan (2004) mentioned that organizations who excel in technology innovation are three times more likely to adopt e-commerce applications compared with those without. Hence, the greater the technology readiness of an organization the more likely the organization adopts IT technology, and vice versa.

Several previous studies supported this views, for example Molla and Licker (2005a) found that both technology infrastructure and human resources as determinant factors in the initial e-commerce adoption by businesses in South Africa. Then, Kuan and Chau (2001) argued that perceived technical competence is the influential factor in EDI adoption by SMEs.

In regard to technology readiness, Ramdani et al. (2013) found this variable as a determinant factor of e-commerce adoption by SMEs in the Northwest of England. In line with this, Tiago and Maria (2010) found technology readiness as an influential factor in e-business adoption by businesses in 27 countries of European Union (EU). Zhu et al. (2006) found that technology readiness has a positive and significant relationship with e-business adoption by businesses in Brazil, China, Denmark, France, Germany, Japan, Mexico, Singapore, Taiwan province, and the United States. Similar results were also found in Shah Alam et al. (2011), Le et al. (2012), Thi and Lim (2011) and Gibbs and Kraemer (2004). Therefore, it is reasonable in this study thet the following hypothesis is proposed.

H4: Technology readiness positively influences the adoption of e-commerce by the SME

#### *3.3.2.2 Firm Size*

Firm size is considered as a determinant factor in adoption of IT innovation by business (Morteza et al., 2011; Chong, 2008; Tan et al., 2007; Premkumar and Roberts, 1999). It is because firm size is related to the ability of business to provide certain resources, both financial and human resources. The larger the size of business means the greater its ability to provide certain resources, and the more likely to adopt e-commerce technology. In addition, Zhu and Kraemer (2005) also mentioned that the greater business scope, the greater requirement for IT. Besides being related to resources availability, more importantly, Zhu et al. (2002) added that the firm size is also associated with a capability for bearing the risk in regard to IT investment, an ability to push business partner to adopt network externalities and an ability to achieve economies of scale. Moreover, Johnson (2010) revealed that small businesses usually have a limited budget, and therefore they are less

likely to invest a large amount of their budget for IT investment. Therefore, it was not surprising that Premkumar (2003) found that the larger firms in their SME group had a higher tendency to adopt communication technology compared to the smaller ones. Thong (1999) and Al-Qirim (2005), both also found that the larger SMEs tended to adopt more sophisticated IS/e-commerce technology than the smaller ones. Therefore, it is reasonable to hypothesize:

H5: Firm size positively influences the adoption of e-commerce by the SME

### 3.3.3 Environmental context

The decision of an organization to adopt any kind of innovation technology is not only driven by rational aims of efficiency but it is also driven by social and environmental factors. The environmental factor refers to external influence, such as pressure from customers, suppliers, competitors, and government that influence an organization in e-commerce adoption.

#### *3.3.3.1 Customers/Suppliers Pressure*

Customer/supplier pressure relates to the degree of pressure from customers/suppliers perceived by Indonesian SMEs. In many cases, the customer/supplier has a power to pressure a firm to adopt a particular kind of technology. For example, multinational corporations (MNCs) often push their branches and suppliers to adopt e-commerce technology to link to a global production network. For example, Wal-Mart has required and pushed its suppliers to use wireless tracking technology, known as RFID technology (Li et al., 2010) as well as car manufacturers in the US that required their suppliers to use EDI in dealing with them (Iacovou et al., 1995). They also argue that the greater the pressure from trading partners perceived by the SME, the more likely the SME to adopt certain technology innovation in order to maintain their own competitive position, as particularly SMEs often depend economically on their larger partner to survive (Duan et al., 2012). Regarding technology innovation such as e-commerce, several previous studies have shown that the trading partners pressure were found as one of determinant factors in adoption of e-commerce technology (Le et al., 2012; Li et al., 2010; Chong, 2008). These then lead to the following

hypothesis.

H6: Customers/suppliers pressure positively influence the adoption of e-commerce adoption by the SME

#### *3.3.3.2 Competitor Pressure*

Competitor pressure refers to the extent of pressure from competitors within the industry that is felt by a firm (Zhu and Kraemer, 2005). Porter (1985) argues that IT innovation affects business competition in three ways, which are:

- "It changes industry structure and, in so doing, alters the rules of competition
- It creates competitive advantage by giving companies new ways to outperform their rival
- It spawns whole new businesses, often from within a company's existing operations".

(Porter, 1985: 150)

When the competitor starts to use e-commerce technology, other firms will be forced to react and to adopt e-commerce technology more widely to obtain competitive advantages. Thus, the higher the level of competition within industry in which company is, the more likely an individual SME will seek to achieve a greater e-commerce use (Zhu and Kraemer, 2005). Previous studies have supported that competitive pressure has a significant relationship with the intention to adopt e-commerce (Morteza et al., 2011; Tiago and Maria, 2010; Al-Qirim, 2007; Zhu and Kraemer, 2005; Zhu et al., 2002). Hence, in this study it is hypothesized that:

H7: Competitor pressure positively influences the adoption of e-commerce by the SME

#### *3.3.3.3 Government Support*

Furthermore, governments also play an important role in term of encouraging business to adopt e-commerce technology, through policies and regulations can drive the business, especially SMEs, to adopt IT technology. They can protect the parties involved in the business transaction, in this case the business or the

customer; regulate the use of the internet to make it a secure medium of transactions; and also provide incentives for companies to use e-procurement in their transactions (Zhu and Kraemer, 2005).

Dasgupta et al. (1999) as cited by Zhu and Kraemer (2005) found that the business that operated in an environment of restrictive government policies seem to have low IT adoption. In addition, government can also use their power to push the business in adoption of certain technology. In 1997 at the United States, in order to response the 'paper reduction act', the US government announced to federal agencies to change to electronic commerce (Kuan and Chau, 2001), so any companies that wanted to make a business relationship with the federal government must adopt such technology. As evidenced in previous studies, this factor was found as one of determinant factors in e-business adoption by organization (Li et al., 2010; Zhu and Kraemer, 2005; Gibbs and Kraemer, 2004; Kuan and Chau, 2001). Thus, based on these explanations the following hypothesis is proposed.

H8: Government support positively influences the adoption of e-commerce by the SME

#### 3.3.3.4 *Technology Vendor Support*

Beside those factors, previous literatures have mentioned that technology support from vendors is also a determinant factor in e-commerce adoption, especially for the SME (Morteza et al., 2011; Al-Qirim, 2007). This is reasonable because as commonly known SMEs lack personnel, especially related to IT and also lack financial resources to hire IT skills from external consultants. Hence, to overcome the IT skill problems, the availability of technology support from vendor can be considered as an effective way for SMEs in the adoption of e-commerce. In the study conducted by Al-Qirim (2007), support from a technology vendor was found as one of determinant factors in extranet/VPN adoption by SMEs in New Zealand. A similar result was also found by Morteza et al. (2011) and Li et al. (2010). The above arguments therefore lead to the following hypothesis.

H9: Technology vendor support positively influences the adoption of e-commerce by the SME

### 3.3.4 Individual Context

As described previously, this study also considers the individual context as a determinant factor in adoption of e-commerce by SMEs in Indonesia. Mostly SMEs in Indonesia are owner-manager business, in which the owner, manager, or sometimes employee is the same person, and usually any strategic decision is highly dependent on such a person. This is in line with Rizzoni (1991) as cited by Shah Alam et al. (2011) that the manager/owner is decisive in deciding of innovation adoption in the SME.

Then, Cloete, Courtney, and Fintz (2002) also revealed that e-commerce adoption by the SME depends extensively on the acceptance of e-commerce technology by the owner of business. It is reasonable, because structurally SMEs tend to centralize, and therefore the owner/manager have an important role in any business decision making (Nguyen and Waring, 2013).

Moreover, Marcati, Guido, and Peluso (2008) found that adoption of innovation among forty-one SMEs in Italy was not only dependent on the traditional external variables but also dependent on the internal factor related to the psychological character of individual entrepreneur.

Therefore, in this study such individual factors are also presumed as influential factors in adoption of e-commerce by the SME in Indonesia. There are three individual factors considered in this study: owner/manager innovativeness, owner/manager involvement and owner/manager IT knowledge.

#### *3.3.4.1 Owner/Manager's Innovativeness*

Innovativeness refers to the degree to which a person adopts the innovation more quickly than others in the same social context (Marcati et al., 2008). It was mentioned by Thong and Yap (1995) that an innovative manager is the one who tends to seek a solution by changing the structure where the problem is located. Simply, the innovative manager prefers to search for a solution that has never

been tried before and therefore is more risky. As commonly known, in spite of a lot advantages offered by e-commerce technology, such technology also has risk, especially if it is applied in a small business and even more so when in a developing countries. Hence, the more innovative SMEs owner/manager the more likely he/she has the intention to adopt the e-commerce application (Ghobakhloo and Tang, 2013). Moreover, the desire of owner to become more innovative will accelerate the adoption of Information System (IS) (Ghobakhloo and Tang, 2013).

Several previous studies have found that the owner/manager's innovativeness as a determinant factor in innovation adoption. For example, Thong and Yap (1995) found that the owner/manager/CEO's innovativeness as determinant factors in IS adoption.Wymer and Regan (2005) found that innovativeness as a significant factor that influenced SMEs in Kentucky, USA in adopting e-commerce. Al-Qirim (2007) found that CEO's innovativeness was the only factor that influences the SME in external e-mail adoption and it was also one of determinant factors in website adoption. Then, Morteza et al. (2011) and Ghobakhloo and Tang (2013) found manager's innovativeness as a significant factor in e-commerce adoption within the SME. The above explanations therefore lead to the following hypothesis.

H10: Owner/manager's innovativeness positively influences the adoption of e-commerce by the SME

#### *3.3.4.2 Owner/Manager Involvement*

Likewise, another individual factor that affects e-commerce adoption is owner/manager involvement. This is related to the support that is given by them to e-commerce adoption. This is not only related to the provision of resources but also related to a motivational aspect that it is important to motivate the entire organization about the potential benefits of technology innovation. In regard to resources provision, as described previously, to be able to adopt technology innovation, such as e-commerce, certain resources are needed; therefore financial support from manager/owner will determine the speed of e-commerce adoption.

On the other hand, in respect of motivational aspects, through the involvement of the owner/manager, the organization feels ready and motivated to adopt technologies such as e-commerce. In addition, owner/manager involvement will help to overcome barriers and resistance to change in the organization (Duan et al., 2012). Hence, the owner/manager's involvement is considered as a determinant factor in adoption of e-commerce by an SME. This is supported by several previous studies. Sila (2013), Duan et al. (2012), and Li et al. (2010), all of whom found that support from management has a positive impact on e-commerce adoption. Then, Al-Qirim (2007) found CEO involvement as important factor in e-commerce adoption by SMEs in New Zealand. Based on these explanations, the following hypothesis is proposed:

H11: Owner/manager involvement positively influences the adoption of e-commerce by an SME

#### *3.3.4.3 Owner/Manager IT Knowledge*

Besides innovativeness and involvement, the owner/manager's IT knowledge is also considered as an individual factor influencing e-commerce adoption. It cannot be denied that one of the problems faced by SMEs in terms of IT adoption is insufficient ability in IT/IS knowledge (Morteza et al., 2011). If a manager has greater knowledge in IS/IT, the manager will be confident in IT adoption and it will reduce the uncertainty and risk in that adoption. Then, the user's skill and knowledge can assist and increase the speed of technology adoption (Morteza et al., 2011). More importantly, it assumes that if owner/managers comprehend the function and advantages of e-commerce adoption, they may be more pleased to adopt e-commerce technology. Several previous studies supported these explanations. Thong and Yap (1995) and Thong (1999) found that the manager's IT knowledge a determinant factors in IT adoption by SMEs in Singapore. Then, Thi and Lim (2011) and Looi (2005) also found that owners/managers IT knowledge to be adeterminant factor that influenced SMEs in adoption of e-commerce. Hence these explanations lead to the following hypothesis.

H12: Owner/manager IT knowledge positively influences the adoption of e-commerce by an SME

## 3.4 E-COMMERCE DEVELOPMENT IN THE ORGANIZATION

The concept “stage of growth” or growth models are often used by previous studies in regard to gaining an understanding of factors affecting e-commerce adoption in business. This concept is driven by a belief that the level and nature of IS in an organization is not fixed but it is located in one of several stage of development, likewise the state of e-commerce. Several stage of growth models have been proposed. The first growth model was developed by Nolan during th 1970s, and is well known as “Nolan’s stages of growth model”. In this model, the evolution of the use and management of an information system in an organization is started from the lowest stage and runs to to the highest stage. He proposed that there were six stages faced by a firm in terms of information system usage, namely “initiation”, “contagion”, “control”, “integration”, “data administration” and “maturity”. Each stage has different features. In regard to cost spend for computing system,Nolan (1979) described it as a S-shape curve, in which the computer budget will increase slightly in the earlier stage and then in line with the complexity of ICT use in business, the expenditure on computer use will also increase sharply.

Tagliavini et al. (2001) also proposed five clusters of e-commerce adoption based on a range of business activities for which SMEs were using e-commerce. These are “public relations”, “company promotion”, “pre/post sales support”, “order processing” and ”payment management”. Each activity has a different figure with different degrees of complication. Tagliavini et al. (2001) also proposed the possible benefit that will gained by business in each activity. For example, in public relations, the use of electronic mail is introduced as an effective way to spread the information about company activities, products, and services to a selected target of customers. For this activity, if the business decides to use an internet services provider with the e-mail service management, the basic skill and cheap investment is enough to meet the business need. However, if the business

determines to manage this service in-house, then more advance skills will be needed. Then, in company promotion in which a web site, ranging from a simple site form to a sophisticated site form, is used to display company activities, products and services offered. Through this activity, expanded market share geographical and better customer service are expected to be achieved by the company.

In line with this, Daniel, Wilson, and Myers (2002) proposed four clusters in e-commerce adoption, which are “developers”, “communicators”, “web presence” and “transactors”. Businesses will be categorized into a particular cluster based on the scope of e-commerce use. For example, the “developers” cluster is characterized by the use of e-mail for communication with suppliers and customers, providing information about the company’s products and services and the company itself, and using the web for advertising and brand building. Then, if the companies are making extensive use of e-mail to communicate with customers and suppliers and between employees, and use the web to find business information, and exchange document electronically, they will be categorized into “communicators”. The “web presence” is the third cluster in which the companies have information-based websites operating and on-line order facilities. The most advanced is “transactor” which is allows firm to place and receive on-line orders and on-line payments.

Then, Rao, Metts, and Monge (2003) proposed a four stage model; “presence”, “portal”, “transaction integration” and “enterprises integration”, to explain the evolution of e-commerce in an organization Each stage has a different characteristic and a different problem to be addressed. In this model, the subsequent stage is better than the previous stage. Even though the evolution is described sequentially, there is no necessity for a business to start from beginning stage (presence stage) and then go through the next stage. Business can start from any stage.

Prananto, McKay, and Marshall (2003) proposed six stages of e-commerce development, which are ”no presence”, ”static online”, ”interactive online”, ”e-

commerce", "internal integration", and "external integration". In line with Rao et al. (2003), Prananto et al. (2003) also mentioned that the characteristics of each stage are different and business can start the e-commerce adoption in any of the stages. They also revealed that the higher stage is achieved, the greater investment will be required and the more benefits that will be gathered.

Another model is the "adoption ladder" which is commonly used by the UK government's Department of Trade and Industry (DTI) to evaluate the extent of the use of Information and Communication Technology (ICT) in UK businesses (Michael and Andrew, 2004). The ladder starts from a simple use of ICT and runs to sophisticated usage. The steps are: "e-mail", "website", "e-commerce", "e-business" and "transformed organization". Higher up the ladder implies more organizational change and sophisticated use of ICT, and in consequence the more benefit that will be gained.

In addition, the PITs model, developed by Foley, Ram, and Britain (2002), is also used to explain a pattern of e-business, including e-commerce, use among SMEs (Michael and Andrew, 2004). In this model, the progression of e-commerce use is determined by two elements. The first element is to what activities e-commerce can be applied. In this case, Foley and Ram (2002) identify there are six main areas of business activities, namely logistics and delivery; finance; purchasing and procurement (including management of infrastructure and support services); operations, processing and assembly (including research and development of products/services); marketing and sales; and after sales services. The second element is how ICT is used by business. In the PITs concept, there are three functions of ICT, which are to publish, to interact and to transform. ICT can be used by the company to publish their information such as company profiles; product and services offered; contact details; term and condition or delivery schedules; and others into web site. Then, ICT can be used to interact with any parties that are involved in business transaction, such as customers, suppliers or government by using automated communications systems. Such interaction could be in verifying credit cards, recognize returning customers, or provide specific

information for customers. Finally, ICT can also be used to transform the order in which businesses conduct their activities. For example, customers are enabled to decide where and when their purchase will be delivered and they are also enabled to track the product delivery in real time. This model is considered by Michael and Andrew (2004) as a better model to accomodate the diversity of application and adoption of e-commerce among SMEs.

The growth models described above reflect that e-commerce technology is not a single or simple innovation (Chong, 2008), and the adoption of this technology by business cannot also be viewed as dichotomous outcome, such as adopted or not adopted. Business can adopt a number of combinations of technologies with various degrees of complexity and sophistication. Thus, to study e-commerce adoption by businesses, it is not appropriate to use the dichotomous measure, as was done by previous studies (Ramdani et al., 2013; Sohaili and Solaymani, 2012; Tiago and Maria, 2010; Grandon and Pearson, 2004b). The use of this measure (such as adopted or non adopted; used or not used) in e-commerce studies will fail to capture the breadth and richness of the use of this technology (Gibbs and Kraemer, 2004), so the result of the study would be subjected to bias (Lip-Sam and Hock-Eam, 2011).

Regarding this, e-commerce adoption in this study is not only considered as dichotomous measures, adopted or not adopted, but it will also be viewed as multi staged. This consideration becomes one of the strengths of this study, and it is expected can eliminate the weaknesses of the use of dichotomous measures by previous studies. In addition, the consideration of this model in this research will also enrich the understanding of SME owners or managers in regard to the development of e-commerce adoption in organizations. This is useful for business in producing an effective business strategy. By knowing a possible stage of e-commerce adoption, business can evaluate their current status of e-commerce adoption and make appropriate preparation to face their upcoming e-business initiatives (Prananto et al., 2003). Moreover, the stage model is useful for SME owners or managers to provide a roadmap of e-business initiatives which assist

them in deciding whether or not to move forward to the next stage. Besides business owners or managers, the stage model is also useful for government in order to know the level of e-commerce adoption in business especially in SMEs in order to make better policies to encourage business, especially the SMEs, to adopt e-commerce technology.

## 3.5 E-COMMERCE AND BUSINESS PERFORMANCE

The relationship between IT investment and business performance has certainly become an interesting research topic for many parties, such as academic researchers, business practitioners or economists, in recent years. Early studies conducted during the 1990s showed inconclusive results regarding this relationship, in which some found that IT spending had either a slightly negative or no correlation with business performance (Strassmann, 1997; Loveman, 1994; Mahmood and Mann, 1993), whilst some found a positive correlation between IT investment and business performance (Brynjolfsson and Hitt, 1998; Mitra and Chaya, 1996).

However, after the 2000s, many studies have shown a positive correlation between IT investments and business performance. For example, Stratopoulos and Dehning (2000) attempted to link IT investment with business performance by comparing the financial performance of companies that were categorized as successful IT users with companies that were less successful IT users. The result of this study showed that the financial performance (measured by profitability and efficiency) of successful IT users companies was greater than for the less successful IT users in the same industry.

Similarly, Bharadwaj (2000) investigated whether firms with superior IT capablities also had superior performance or not. In this study, firms with superior IT capabilities were identified by using data provided by InformationWeek, and firm performance was measured by five measures: Return on Asset (ROA), Relative Market to Book Value (RELMV), sales, growth and risk. The study found that firms with superior IT capabilities demonstrated superior firm performance and lower cost than firms in the control group. This result was also

reaffirmed by Santhanam and Hartono (2003). By extending the Bharadwaj study, they also found that firms in the IT leader group showed superior performance than other groups.

Barua, Konana, Whinston, and Yin (2004) also found that the level of digitization on the customer side has a positive correlation with financial performance. Then, based on meta analysis of 50 published studies (between 1990–2009) that investigated a relationship between IT investment and firm performance, Liang, You, and Liu (2010) found that the relationship between IT investment and firm performance can be explained by an indirect model, in which the IT resources can enchance firm capabilities, and then the firm capabilities can improve firm performance. In addition, a recent study conducted by Ong and Chen (2013) and Ong and Chen (2014) found that firms with superior IT capabilities also have superior firm performance and firm value than their counterparts.

Rather than considering IT investment in general, several previous studies have tried connecting a specific IT investment, such as Supply Chain Management (SCM), e-business and e-commerce, with business performance. Dehning, Richardson, and Zmud (2007) examined the relationship between IT investment in Supply Chain Management (SCM) with financial performance measured by Return on Asset (ROA), total inventory turnover, Return on Sales (ROS). By using 123 manufacturing firms in the US as the sample, they found that implementation of IT based SCM by business can reduce the level of inventory, and that IT based SCM also has a positive relationship with business performance. This finding is consistent with Byrd and Davidson (2003) and Vickery, Jayaram, Droge, and Calantone (2003) studies. In the same vein, Ranganathan, Dhaliwal, and Teo (2004) also found that the extent of assimilation of web technologies in SCM has a positive correlation with the benefits realized by business. It was found that business with the greater assimilation realized the greater benefits.

Raymond and Bergeron (2008) attempted to link the alignment of e-business capabilities in business strategy with business performance, measured by growth,

productivity and profitability. It was found that e-business capability has a positive and significant relationship with the profitability and productivity. Besides e-business capability, Zhu and Kraemer (2005) also found that e-business usage has positive correlation with the business performance. This study demonstrated that the greater e-business use, the more likely to generate higher e-business value.

In regard to e-commerce, empirical evidences have shown a consistent result. Zhu (2004) found that e-commerce capability and IT infrastructure have a positive relationship to business performance. In this study, business performance was measured by four measures, which are revenue generation, cost reduction, asset turnover and inventory turnover. Clayton and Criscuolo (2002) demonstrated that firms who are active in e-commerce use appeared to have a higher percentage of sales than those not active. In line with this, Salwani et al. (2009) also found that e-commerce usage has a correlation with the business performance. They also found e-commerce experience as a moderating factor in the relationship of e-commerce usage and business performance. In addition Zhu and Kraemer (2005) demonstrated that firms with a greater scope of e-commerce use will experience a greater performance impact. In this study, the scope of e-commerce use refers to "the extent of e-commerce use for a number of different activities in the value chain, from advertising and marketing to sales, procurement, service and support, data exchange with customers and suppliers, and integration of business processes" (Gibbs and Kraemer, 2004: 132). A recent study by Hua, Morosan, and DeFranco (2015) also demonstrated that there is a significant relationship between e-commerce investment and hotel performance.

In regard to the impact of e-commerce adoption on SMEs performance, several previous studies have also shown a similar result. For example, Sila and Dobni (2012) demonstrated that SMEs with a higher level of B2B e-commerce usage produced a stronger performance. Ramanathan, Ramanathan, and Hsiao (2012) found that e-commerce adoption by Taiwanese SMEs has significant correlation with SMEs performance. Then, Abebe (2014) also gives support to previous

results in which the e-commerce technology has a positive effect on SME performance. A recent study by Ainin, Parveen, Moghavvemi, Jaafar, and Mohd Shuib (2015) also shown that the use of social media by SMEs has a positive correlation with SME performance.

Therefore, based on the explanation above, it can be seen that there is a positive correlation between IT in general and e-commerce in particular, with business performance. Seven key advantages offered by e-commerce technology are reduced transaction costs (Molla and Heeks, 2007); increased customer retention and loyalty (Chiliya et al., 2011); improved internal and external communication (Molla and Heeks, 2007); increased sales (Abell and Lim, 1996); increased internal efficiency (Mustaffa and Beaumont, 2004); improved information quality, reduce stock level (Dehning et al., 2007); and assisting business to enter a new market (MacGregor and Vrazalic, 2007a). The greater the e-commerce benefits gathered by business the greater the impact on the business performance.

The level of benefits gathered by business are commonly determined by the level of e-commerce adoption (Prananto et al., 2003). They argued that the higher the level of e-commerce adoption, the more that sophisticated technology infrastructures are required, and the greater benefits that will be gathered. Kraemer et al. (2002) investigated the impact of transacting on line, and they found that the extent of e-commerce capabilities has a positive correlation with the benefits gathered by business. Similarly, Molla and Heeks (2007) found that business with high level of e-commerce capability seemed to obtain greater benefits than others. Therefore, based on these explanations, the following hypotheses are proposed.

H13: The higher the level of e-commerce adoption by an SME, the more likely for that SMEs to gather the greater benefits of the e-commerce

H14: The adoption of e-commerce by an SME positively influence their performance

## 3.6 SUMMARY OF HYPOTHESES OF THE STUDY

Based on explanation above, there are fourteen hypotheses tested in this study. In regard to issues discussed in this study, these hypotheses can be classified into two main categories. The first is upstream issues which focus on the influencing factors of e-commerce adoption, while the second is downstream issues which focus on post adoption benefits. In this regard, H1 to H12 fall in the first category, and H13 and H14 fall in the second category.

All of the hypotheses are aimed to answer a certain research objective. for example, H1 to H12 relate to the second research objective, which is: to identify factors that influence Indonesian SMEs in adopting e-commerce. Whilst, H13 and H14 are associated to the third and the fourth research objectives, which are: to identify benefits gathered by Indonesian SMEs in adopting e-commerce; and to investigate the relationship between e-commerce adoption and SME performance.

Table 3.1 below presents a summary of the hypotheses.

| **Table 3-1:** Summary of Hypotheses | Issues Discussed | Objectives Related |
|---|---|---|
| H1: Perceived benefits positively influence the adoption of e-commerce by SME<br>H2: Compatibility positively influences the adoption of e-commerce by the SME<br>H3: Cost negatively influences the adoption of e-commerce by the SME<br>H4: Technology readiness positively influences the adoption of e-commerce by the SME<br>H5: Firm size positively influences the adoption of e-commerce by the SME<br>H6: Customers/suppliers pressure positively influences the adoption of e-commerce by the SME<br>H7: Competitor pressure positively influences the adoption of e-commerce by the SME<br>H8: Government support positively influences the adoption of e-commerce by the SME<br>H9: Technology vendor support positively influences the adoption of e-commerce by the SME<br>H10: Owner/manager's innovativeness positively influences the adoption of e-commerce bythe SME<br>H11: Owner/manager involvement positively influences the adoption of e-commerce by the SME<br>H12: Owner/manager IT knowledge positively influences the adoption of e-commerce by SME | Upstream issue, which focus on influencing factors of e-commerce adoption | The second objective: to identify factors that influence Indonesian SMEs in adopting e-commerce |
| H13: The higher the level of e-commerce adoption by an SME, the more likely for that SMEs to gather the greater benefits of the e-commerce<br>H14: The adoption of e-commerce by an SME positively influence their performance | Downstream issue, which focus on post benefits adoption | The third and fourth objectives: to identify benefits gathered by Indonesian SMEs in adopting e-commerce; and to investigate the relationship between e-commerce adoption and SME performance. |

## 3.7 CONCLUSION

This chapter presented a review of the related literature on e-commerce adoption by business in general and SMEs in particular. In this chapter many studies regarding to e-commerce adoption were presented and reviewed. It is shown that there have many been theories developed or adopted in regard to the study of e-commerce. Six of these theories are TRA, TPB, TAM, PERM, IDT and TOE and these were described in detail in the beginning of this chapter. The application of these theories in e-commerce studies is variable. Some studies applied a single theory, and some of studies applied a combination of two or more theories. In addition to theories applied, this chapter also described how e-commerce adoption studies can be grouped into five categories. Then, based on an extensive review of e-commerce adoption literatures, fourteen hypotheses were proposed. Finally, this chapter also described e-commerce development in organizations and the impact on business performance.

# CHAPTER 4: RESEARCH METHODOLOGY

## 4.0 INTRODUCTION

This chapter explains the research methodology used in this study. It starts by explaining the research objectives and research questions in section 4.1. This is followed in section 4.2 by describing research philosophy which consists of the ontological and epistemological considerations.

Then, in section 4.3, the research design of this study is explained. This section considers the methodological choices; the research strategy; the time horizon; and data collection and analysis. Finally, section 4.4 concludes this chapter.

## 4.1 RESEARCH OBJECTIVE AND RESEARCH QUESTIONS

As previously described in Chapter One, the objectives of this research are:

1. To investigate the extent of the adoption of e-commerce in Indonesian SMEs;
2. To identify factors that influence Indonesian SMEs in adopting e-commerce;
3. To identify benefits gathered by Indonesian SMEs in adopting e-commerce;
4. To investigate the relationship between e-commerce adoption and SME performance.

The following four research questions were addressed:

1. What is the extent of the adoption of e-commerce in Indonesian SMEs?
2. Which factors influence Indonesian SMEs in adopting e-commerce?
3. What are the benefits gathered by Indonesian SMEs in adopting e-commerce?
4. Is there any relationship between e-commerce adoption and SME performance?

## 4.2 RESEARCH PHILOSOPHY

Research is not only merely talking about how to collect and analyse the data, but the important things about the research is "the essence" of the research, which relates to the logic behind the research or it relates to the question "why research?". This can be easily explained if the researcher has an understanding about the research philosophy. According to Saunders (2009) the research philosophy is associated to the knowledge and the nature of the knowledge.

An understanding of philosophical issues is needed by researcher in regard to:

1. To understand interrelationship of the key components of research (including methodology and methods);
2. To avoid confusion when discussing theoretical debates and approaches to social phenomena; and
3. To be able to recognise others', and defend our own positions.

Source: Grix (2002)

Three philosophical assumptions to be considered are ontology, epistemology and methodology. The ontological reflects the point of view of researcher in regard to the nature of phenomena or social reality, whether it happens independently or it occurs because of intervention of social actors. The epistemology relates to how the researcher can know about the nature of phenomena or social reality. Then methodology is concerned with "the logic of scientific inquiry; in particular with investigating the potentialities and limitations of particular techniques or procedures" (Grix, 2002).

### 4.2.1 Ontological Position

The term "ontology" is taken from Greek word, which are "*onto*" (being) and "*logia"* (written and spoken discourse). In the Oxford English dictionary, the word "ontology" is defined as "the symbol of social reality in which a theory is based". Three seminal definitions of ontology are:

> "The ontology assumptions are concerned with the nature of social reality. These assumptions make claims about what kinds of social phenomena do or can exist, the condition of their existence, and the ways in which they are related" (Blaikie, 2009: 92)

> "The ontology is the study of being. It is concerned with 'what is', with the nature existence, with the structure of reality as such"(Crotty, 1998).
>
> "Ontological assumptions are concerned with the very essence of the phenomena under investigation…..the ontological question: whether the 'reality' to be investigated is external to the individual – imposing itself on individual consciousness from without – or product of individual consciousness; whether 'reality' is of an 'objective' nature, or the product of individual cognition; whether 'reality' is a given 'out there' in the world, or the product of one's mind". (Burrell and Morgan, 1979: 1)

All of above definitions agree that the ontology is a very fundamental question for any research. The ontology mirrors the researchers belief about a phenomena, entity or social reality, and whether the phenomena, or social reality, exists beyond the intervention of the social actor or it is created, or affected by the action or perception of the social actor. The former is recognized as the *objectivism* position, while the last is considered as the *subjective* position.

The objectivist assumes that the phenomena or social reality as a "hard, tangible and relatively immutable structures" (Burrell and Morgan, 1979: 4). As such, the researcher can study the phenomena or social reality by seeing the pattern and finding the causal relationship to create a new understanding.

The subjectivists, on the other hand, believe that the phenomena or social reality "is made of nothing more than names, concepts and labels which are used to structure reality" (Burrell and Morgan, 1979: 4). They believe the phenomena will be seen differently by each individual, so to be understood deeply, the researcher should be involved in that phenomena.

It cannot be denied that there is a long-standing debate about objectivism and subjectivism. However, recent literatures has agreed that the both ontology position cannot be seen as something opposing and separating, but that the ontological posistion should be seen as multiple dimensional set of continua.

Saunders, Lewis, and Thornhill (2009) introduced two other ontology posistions that mediate objectivism and subjectivism positions, which are realism and pragmatism. Similar to objectivism, the realist is also of the belief that the phenomena or reality exist beyond the intervention of social actor, however

realists believe that it is interpreted through social conditioning. However pragmatism, on the other hand, focuses more on practical impact. Pragmatist argues that the ontology and epistemology position of a research is highly determined by the research question. The researcher can combine a multi perspective and methodology to answer the research question.

### 4.2.2 Epistemology Position

As mentioned earlier, how the researchers view on the phenomena/reality will be related to how they can know about it, which is known as epistemology. This is defined as "the theory of knowledge, especially in regard to its methods, validation and the possible ways of gaining knowledge of social reality, whatever it is understood to be" (Blaikie, 2000).

In order to study about the phenomena/reality, the researchers can adopt a method that commonly used in natural science, by observing the phenomena to see its pattern and found its causal relationship, or they can directly be involved in that phenomena/reality to gain a deeper understanding. The first method is considered as *positivsm,* while the latter is considered as *anti-positivism* (Burrell and Morgan, 1979).

The logical thinking of a positivist is based on their assumption that the phenomena/social reality is recognized as tangible and its structure is a relative constant, so it can be observed. It looks like a physical resource in natural science, the observable phenomena is believed can produce credible data, so by applying the natural science method "law-like generalisations" can be created. In contrast, the anti-positivists believe that the phenomena/reality will be felt differently by each individual, therefore if the researchers want to know deeply about the phenomena/reality they should involve with it rather than see it from the outside.

As previously explained, these opposite assumption held by positivists and anti-positivists has raised a long standing debate between them. However, in recent years these two positions have been mediated by the practice of using a multiple

dimensional set of continua, which are “positivism”,”realism”, ”interpretivism” and ”pragmatism”

As explained before, positivist believes that the phenomena can be considered as a ‘resource’, so it can be explained by applying the scientific method. In this condition, the positivism research is admitted could be conducted in ‘value-free’ way (Saunders et al., 2009).

Similarly with positivists, the realist also believes in the use of natural science method to develop a knowledge. However, realists does not believe about observable phenomena, they assume that “what we directly observe in both nature and in society is generated by hidden mechanisms which we cannot observe, but which the scientist infer from observations and theoretical work” (Harambalos, 1985).

The interpretivist, on the other hand, disagrees with either the positivist or realist in terms of the use of science methods in explaining the phenomena, because they believe that the phenomena/reality is too complex to be explained based on its pattern or its regularity. Moreover, the interpretivist also argues that to study people is different to studying an object in natural science, so this method is not appropriate to be applied in the study of social phenomena. The social reality is just only understood deeply by those who have experience of it; therefore to know it, the researcher should be involved in the reality in order to get a view from subject’s stand point.

For the pragmatist, the key focus in any study is its practical impact (Saunders et al., 2009). So, the pragmatist believes that there are many ways to interpret the world and so it can be viewed from a ‘multi point’ of view.

### 4.2.3 Methodology

As described earlier, both ontology and epistemology positions will guide the researcher to choose an appropriate way to get information about the phenomena/reality, which is known as *research methodology*. In this regard, a “methodology” is different to a “method”. The methodology is “concerned with

the logic of scientific inquiry; in particular with investigating the potentialities and limitations of particular techniques or procedures" (Grix, 2002: 179), whilst methods relate to "the techniques or procedures used to gather and analyse data related to some research question or hypothesis" (Crotty, 1998: 3). Saunders (2009) has summarized the techniques that commonly used for each ontology and epistemology position.

Table 4-1 below presents a comparison of four research philosophies and appropriate data collection techniques.

4-1: Comparison of Four Research Philosophies

| | Positivism | Realism | Interpretivism | Pragmatism |
|---|---|---|---|---|
| Ontology: the researcher's view of the nature of reality or being | External, objective and independent of social actors | Is objective. Exists independently of human thoughts and beliefs or knowledge of their existence (realist), but is interpreted through social conditioning (critical realist) | Socially constructed, subjective, may change, multiple | External, multiple, view chosen to best enable answering of research question |
| Epistemology: the researcher's view regarding what constitutes acceptable knowledge | Only observable phenomena can provide credible data, facts. Focus on causality and law like generalisations, reducing phenomena to simplest elements | Observable phenomena provide credible data, facts. Insufficient data means inaccuracies in sensations (direct realism). Alternatively, phenomena create sensations which are open to misinterpretation (critical realism). Focus on explaining within a context or contexts | Subjective meanings and social phenomena. Focus upon the details of situation, a reality behind these details, subjective meanings motivating actions | Either or both observable phenomena and subjective meanings can provide acceptable knowledge dependent upon the research question. Focus on practical applied research, integrating different perspectives to help interpret the data |
| Data collection techniques most often used | Highly structured, large samples, measurement, quantitative, but can use qualitative | Methods chosen must fit the subject matter, quantitative or qualitative | Small samples, in-depth investigations, qualitative | Mixed or multiple method designs, quantitative and qualitative |

Sources: Saunders et al., (2009: 109)

## 4.3 RESEARCH PHILOSOPHY CONSIDERATION FOR THIS STUDY

As this study aims to provide a comprehensive understanding about the adoption of e-commerce by SME, this rsearcher believes that the use of multiple view points, perspectives and standpoints is appropriate to address such an objective. Choosing between one position and the other (either positivism and interpretivism) is somewhat unrealistic to be applied in this study. A single perspective would not be able to provide that comprehensive model of e-commerce adoption.

In addition to this, three benefits could be achieved by using the multiple view points and perspectives as revealed by Rossman and Wilson (1995). First, the use of multiple view points/perspectives allows confirmation and corroboration of each other through triangulation. Second, the use of multiple view points/perspective allows to develop analysis in order to provide richer data. Third, the multiple view points can be used to initiate a new model of thinking that emerge from the two data sources.

Based on the explanation above, it can be seen that this study relies on the pragmatism position. Therefore, in line with the Table 4-1 above,a mixed method was applied in this researh. According to Johnson, Onwuegbuzie, and Tuner (2007: 123), the mixed method is defined as:

> The type of research in which a researcher or team of researchers combines elements of qualitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration.

## 4.4 RESEARCH METHODOLOGY

Research design is the comprehensive plan of the researcher enacted to answer their research questions. More specifically, Sekaran and Bougie (2013: 95) reveal that it is a "blueprint for the collection, measurement, and analysis of data, based on the research questions of the study".

According to Saunders, Lewis, and Thornhill (2012), it includes not only methodological choice, whether mono method (quantitative or qualitative) or multiple methods are chosen, but it also contains research strategy choices, time horizon, research techniques and procedures and data collection and data analysis.

### 4.4.1 Methodological choices

In general there are three methodological choices available:

1. Mono methods, which can be divided into qualitative and quantitative
2. Multi method, which can be divided into multi-method qualitative and multi-method quantitative.
3. Mixed method

The quantitative or qualitative methods are often distinguished by some researchers through the presence of either numeric data or non-numeric data. Generally, any techniques or procedures that are related to the use of numeric data will recognized as quantitative research, whilst, in contrast, any techniques or procedures that related to the use of non numeric data will considered as qualitative research.

As described previously, this research relied on the pragmatism approach, and therefore, this led to applying a mixed methodology to this research. Johnson et al., (2007), divided mixed method into three group, which are mixed method-quantitative dominant, mixed method-qualitative dominant and pure mixed method. A research will categorized as quantitative dominant if it actually fall into quantitative research but the researcher believes that it is important to include a qualitative approach to that research project. A qualitative dominant, in contrast,

is when the researcher believes it appropriate to include a quantitative approach in a qualitative research project.

It is undeniable that the majority of e-commerce adoption studies used a quantitative research method. Table 4-2 presents selected e-commerce adoption studies concerning SMEs. Even though, e-commerce adoption studies are widely associated with quantitative method, however this researcher believes that the qualitative data is also important to be used in order to support the finding from the quantitative data.

Based on the explanation above, therefore, this research can be categorized as mixed method-quantitative dominant.

**Table 4-2:** Selected e-commerce adoption studies in SME

| No | Authors | Objectives | Location | Methods | Sample size |
|---|---|---|---|---|---|
| 1 | Rogers (1995) | To investigate what factors determine the likelihood of adoption of e-commerce in Malaysian SMEs | Klang Valley, Malaysia | Quantitative, Mail survey | 200 |
| 2 | Mehrtens, Cragg, and Mills (2001) | To examine the factors, which come from internal, external and contextual perspective affecting B2B adoption in China | China | Quantitative, Survey | 134 |
| 3 | Tan et al. (2009) | To explore the factors that affect SME adoption of internet commerce and other e-commerce issues | Australia | Qualitative Multi case study approach | 23 |
| 4 | Premkumar, Ramamurthy, and Nilakanta (1994) | To identify various determinant factors in web site implementation in small business | Canada | Quantitative, Mail survey | 68 |
| 5 | Grandon and Pearson (2004b) | To examine the determinant factors of strategic value and adoption of EC by USA SMEs | US | Quantitative, An electronic survey. | 100. |
| 6 | Poon and Swatman (1999) | To examine the determinant factors of strategic value and adoption of EC by SMEs | West African, Ghana | Quantitative, Survey | 107 |
| 7 | Teo et al. (2003) | To determine which perceived innovation characteristic, benefits and barriers of internet based ICT influence their adoption by SME | Malaysia | Quantitative, Mail survey | 406 |
| 8 | Wymer and Regan (2005) | To identify the factors that effect e-commerce adoption decisions, and to determine the level of influence of factors, either positively or negatively from the adopter perspective. | 49 Appalachian counties of Kentucky, USA. | Quantitative, Survey. | 102 |

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|---|---|---|---|---|---|
| 9 | Al-Qirim (2007) | To investigate the impact of 10 factors on adoption of different e-commerce communication and application technologies in SMEs | New Zealand | Quantitative, survey | 129 |
| 10 | Gibbs and Kraemer (2004) | To investigate the determinant of e-commerce scope of use among e-commerce adopters | 10 countries (Brazil, China, Denmark, France, Germany, Japan, Mexico, Singapore, Taiwan and United states), | Quantitative, Survey | 2139 |
| 11 | Rao et al. (2003) | To propose a stage model for e-commerce development and addresses the facilitators and barriers for SMEs during different stage of development | European company in KITE project | Case Study | 4 cases |
| 12 | Eikebrokk and Olsen (2007) | To investigate the factors influencing adoption of B2B trading exchange in small businesses | Western Australia | Mix method | 7 for qualitative stages; 211 for quantitative stage |
| 13 | Govindaraju et al. (2012) | To investigate the factors that influence SMEs in adopting e-commerce | Indonesia | Quantitative, Survey method | 111 |
| 14 | Chwelos et al. (2001) | To identify the B2B e-commerce (B2BEC) usage pattern in SME, and the subsequent effect of these pattern on firm performance | North American | Quantitative, Survey | 229 |
| 15 | Thi and Lim (2011) | To examine the determinant factors of e-commerce adoption using a multinomial logit model with | Malaysia | Quantitative, Survey | 187 |

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|---|---|---|---|---|---|
| | | multiple outcomes on the adoption level. | | | |
| 16 | Duan et al. (2012) | To examine the determinant factors of e-market adoption by SMEs in Australia | Australia | Quantitative, Survey | 212 |
| 17 | Thong and Yap (1995) | To investigate the effect of organizational characteristic and individual characteristic on IT adoption by SMEs | Singapore | Quantitative, Survey | 166 |
| 18 | Yousafzai et al. (2010) | To analyse the different factors affecting the adoption of E-marketing by Egyptian small tourism organizations | Egypt | Quantitative, Survey | 163 |
| 19 | Johnson (2010) | To investigate the factors that affect the adoption of e-business by firms | 27 countries / EU member | Quantitative, Survey | 2,459 |
| 20 | Kuan and Chau (2001) | To investigate the determinant factors of EDI adoption by small business. | Hong Kong | Quantitative, survey | 575 |
| 21 | Kurnia, Choudrie, et al. (2015) | To assess factors related to organizational, environmental, and industry and national readiness that influence SMEs in adopting of e-commerce | Malaysia | Quantitative, Survey | 125 |
| 22 | Awa, Baridam, and Nwibere (2015) | To investigate the influence of demographic characteristics of top management team on e-commerce adoption by SMEs | Nigeria | Quantitative, Survey | 226 |

### 4.4.2 Research Strategy

There are seven categories of research strategy that could be selected by a researcher. The first is experimental research, which adopts a natural science method in order to study a phenomena or social reality. This method is often used to explain intercorrelation between variable, whether a change in one variable is due to changes in another variable or not. This method is suitable for use in an explanatory study, the study to see the causal relationship between variables; but it is less useful in an exploratory study which is conducted to discover a deep insight about a phenomena/situation; or a descriptive study, to illustrate an object, event or situation in accurate way; and business and management problems (Sekaran and Bougie, 2013)

The second is a survey study. The survey is one of methods used to collect the information from, or about, people in order to explain their attitude, knowledge or behaviour (Sekaran and Bougie, 2013). It is very popular in business research. This method is usually aimed to answer the "what", "who", "where" and "how much" and "how many" questions, and it is suitable applied for both explanatory and descriptive research.

Then, the third is the case study. The case study is "a strategy for doing research which involves an empirical investigation of particular contemporary phenomenon within its real life context using multiple sources of evidences" (Robson, 2002, as cited by Saunders et al. (2009)). The fourth is action research, which is "a cycle of posing questions, gathering data, reflection, and deciding on a course of action" (Ferrance, 2000). Action research is best dercribed as the repeated process of diagnosing, planning, taking action and evaluating in order to solve the problem or to get better solutions.

The fifth is grounded study, where the aims is usually to generate or discover a theory (Glaser and Strauss, 1967). It defined as "the discovery of theory from data systematically obtained from social research" (Glaser and Strauss, 1967: 2). The sixth is an ethnography study, which refers to "the study of social interactions, behaviours, and perceptions that occur within groups, teams, organizations, and

communities" (Reeves, Kuper, and Hodges, 2008). It is rooted in anthropology field. Then, the last is archival study, which refers to the study which use administrative records and documents as a main sources of data (Saunders et al., 2009).

The researcher can choose one of these categories or combination of two or more categories. The choice of research strategy is dependent upon the research questions and objectives, and whilst it links with ontology and epistemology considerations, it is also influenced by four other major factors, such as time constraint, the extent of existing theory, availability of resources, and accessibility of data sources (Saunders et al., 2012).

Among these categories only two of them are highly associated to quantitative research, which are the survey and the experiment study (Saunders et al., 2012). The former is appropriate to use to test predicted causal relationship and it is suitable to answer "what", "how" and "why" questions (Saunders et al., 2012). The experiment is appropriate for study which need the precise measure of the size and the direction of the effects (Hakim, 2012). Then, it is also useful for explanatory research, but it is less useful for exploratory or descriptive studies (Sekaran and Bougie, 2013). Experiments are a longitudinal study requiring at least two times period, before and after the event. Due to its nature, this type is less commonly used in business and marketing research.

In contrast, the survey method is the most frequently used in the business and marketing research. It is because the survey "allows researcher to collect qualitative and quantitative data on many types of research questions" (Sekaran and Bougie, 2013: 102), and it offers several advantages regarding its ability to cover a large number of data economically, its ability to generalize the results and its replicability due to the use of a highly structured methodology and it is also value-free (Nasco et al., 2008). The survey is appropriately used to test the relationship between variables (Saunders et al., 2012), and it is appropriate to answer "what", "who", "where" and "how much" and "how many" questions. The survey is usually conducted over a short discrete time period, commonly

known as a cross sectional study. Hence, in this regard the survey method was employed in this research.

### 4.4.3 Time Horizon

In general, the time horizon can be classified into two, a longitudinal and a cross sectional study. The longitudinal study is a "study of people or phenomena at more than on point" (Sekaran and Bougie, 2013). The cross sectional study, in contrast, is a study of people or phenomena at one point. The implication of this condition is the former take more time, effort and cost rather than the later (Sekaran and Bougie, 2013). However, the choice of the time horizon types should be not merely based on this but also be influenced by: research purposes and research question; research strategy; and time availability (Saunders et al., 2009)

Taking these aspects into account, a cross sectional study was selected in this research. The reasons for this selection are based on following considerations. Firstly, as previously explained, the cross sectional study is often applied to a survey strategy, even more Bryman (2012: 59) noted that "the cross sectional design is often called a survey design". Hence, the survey strategy is highly related to the cross sectional study. Secondly, as academic research, this research is also constrained by time. As suggested by Saunders et al. (2012), the cross sectional study is appropriate to be applied on this situation.

### 4.4.4 Data Collection

Data is defined as a "facts, opinions and statistics that have been collected together and recorded for reference or for analysis"(Saunders et al., 2012: 669). There are several method available to collect the data, which are secondary data, observation, interviews, and questionnaires (Sekaran and Bougie, 2013; Saunders et al., 2012).

Secondary data means that the researcher uses the data that have already been collected by someone or people or organization for some other purpose (Saunders et al., 2012). This technique provides several advantages, namely, low cost and short time required; feasible for longitudinal study; provides comparative and

contextual data; unobtrusive; and permanence of data (Saunders et al., 2012). However, secondary data, collected by other people often for other purposes, does not always match with other researchers need, and it might be that the terms and definitions used on this data are not suitable for certain research. Moreover, the quality of data gathered by other people cannot be controlled. Hence, in regard to this research this technique was rejected.

Observation refers to collecting data by watching, observing, recording, analysing and interpreting a behaviour, act, or event systematically (Sekaran and Bougie, 2013; Saunders et al., 2012). Through observing a phenomena or behaviour, the researcher can gather detailed information about 'what is going on' in certain social conditions (Saunders et al., 2012), or people activities or people behaviour in a natural environment setting (Sekaran and Bougie, 2013). Some would argue, for example, this is certainly more effective and accurate in describing the phenomena or behaviour than other techniques (Bryman, 2012). In spite of these advantages, however this technique has several disadvantages in terms of time and cost, ethical problems, difficult access, difficulty to record the data and also observer bias. This method is most appropriate to study actions and behaviour (Sekaran and Bougie, 2013) and it is also suitable for descriptive study. Hence, this technique is also not suitable for this research.

Other techniques of data collection are the interview and the questionnaire. Interviews refer to collecting data by asking purposeful questions to people directly regarding the research topic and then listening to their answers thoroughly (Saunders et al., 2012). Whilst, the questionnaire pertains to a "preformulated written set of questions to which respondents record their answers, usually within rather closely defined alternatives" (Sekaran and Bougie, 2013: 147). From the definitions above, it can be seen that the interview and the questionnaire have a similarity in term of how to collect the data. Both of these techniques use a set of questions to gather the information from respondents. However, the former is done by direct interaction between interviewers and respondents through telephone or face to face. On the other hand, the

questionnaire can be sent by e-mail, post or internet and the respondents can complete the questionnaire by themselves without interacting with the interviewers. Both interviews and questionnaire are suitable for use in exploratory and explanatory research, and both techniques are often used in a survey strategy. Furthermore Bryman (2012) revealed that the interview and the questionnaire are the main modes to administer a survey strategy. Therefore, both techniques are considered as suitable techniques to be applied in this study.

The interview and the questionnaire have advantages and drawbacks. Table 4-3 below presents the summary of the advantages and drawbacks of the interview and the questionnaire.

**Table 4-3:** The Advantages and Disadvantages of Interviews and Questionnaire

| Criteria | Interview | | Questionnaire | |
|---|---|---|---|---|
| | Advantages | Disadvantages | Advantages | Disadvantages |
| Access to information | √ | | | × |
| Anonymity | | × | √ | |
| Application skills | | × | √ | |
| Bias | | × | √ | |
| Confidentiality | | × | √ | |
| Cost | | × | √ | |
| Data Analysis | | × | √ | |
| Flexibility | √ | | | × |
| Reliability | √ | | | × |
| Response Rate | √ | | | × |
| Sample size and sampling | | × | √ | |
| Time | | × | √ | |
| Validity | √ | | | × |

Source: Burcu (2000: 9)

It can be seen from the table above that the disadvantages of interviews are the advantages of the questionnaire; and vice versa. This condition implies that these techniques will be complementary if both are used together in a research. Therefore, the questionnaire and the interviews were used as data collection techniques in this study (the details about these techniques are described in following section)

#### *4.4.4.1 Questionnaire*

A questionnaire is defined as "a preformulated written set of questions to which respondents record their answers, usually within rather closely defined alternatives" (Sekaran and Bougie, 2013: 147). More generally, Saunders et al. (2012: 416) revealed that questionnaire refers to "all methods of data collection in which each person is asked to respond the same set of questions in a predetermined order". It is considered as one of main methods in data collection for survey strategy (Saunders et al., 2012).

Saunders et al. (2012) classified questionnaires based on a way it is sent, returned or collected into two types; "self-completed" questionnaire and "interviewer completed" questionnaire. Self-completed questionnaire means a questionnaire is filled by respondent. It can be dispatched and returned by postal (postal/ mail questionnaire); it can be sent and returned electronically by internet (internet-based questionnaire) or intranet (intranet-based questionnaire); or it can be delivered and collected by hand to respondent directly (delivery and collection questionnaire). Interview-completed questionnaire means that the questionnaire is completed by interviewer based on each respondent's answer. It can be done by using telephone (telephone questionnaire) or a physical meeting with an interview (structured interview).

The choice of which type depends on several factors, for example the characteristic of respondents, types of questions, number of question, sample size required, time available to complete collection (Saunders et al., 2012), and research strategy (Oppenheim, 2000). In this research the former is preferred to be used rather than later because of the following reasons:

1. The self-completed questionnaire is less time consuming than the interviewer-completed questionnaire (Bryman, 2012)
2. The self-completed questionnaire is cheaper than the interview-completed questionnaire (Bryman, 2012)
3. The self-completed questionnaire is more convenience for respondents than the interview-completed questionnaire (Bryman, 2012)

4. There is no interviewer effect and interviewer variability on the self-completed questionnaire (Bryman, 2012)
5. The self-completed questionnaire is a common and popular method of primary data collection in e-commerce adoption research
6. The respondents of this research are (given the geography of Indonesia) dispersed widely, so it is suitable method to cover wide area (Saunders et al., 2012).

As described earlier, the self-completed questionnaire can be categorized three ways; postal questionnaire; internet or intranet questionnaire; and delivery and collection questionnaire. The first two; postal and internet questionnaire, were applied in this research. It is because the combination of postal, e-mail and web are believed can enhance the representativeness of the samples. According to Chong (2008), multi methods can cover a broad area of sample without biasing other results. Then, Swoboda et al (1997) argues that by using multi-mode survey, the researcher could get responses from a wider range of respondents and so increase response rates. This multi-mode allows respondents to choose a suitable way to participate and this condition might increase their motivation to being a part of survey (Chong, 2008).

Another reason is the internet or intranet questionnaire, called by Bryman (2012) as online or web survey, offers several advantages, which are cheaper, better, faster, and easier than others modes (Ronald, 2002). However, this method has several weaknesses, especially if this method is applied to respondents who have limited internet access. Hence, to overcome this weakness, the postal survey was also used in this research. This combination between an online survey and a postal questionnaire wasdesigned to boost the response rate of this research.

For the internet questionnaire, the *Bristol Online Survey* (BOS), was used in this research. This is commercial software subscribed to by Huddersfield University.

##### *4.4.4.1.1 Questionnaire Design*

In designing a questionnaire, one or a combination of the following things can be conducted by researchers:

1. Adopt questions used in other questionnaires;
2. Adapt questions used in other questionnaires;
3. Develop their own questions

(Saunders et al., 2012: 431)

In this research, (2) and (3) were applied. As described in previous chapter, twelve independent variables are examined in this study. The first is *perceived benefits* which refer to the degree of acceptance of the possible advantages that e-commerce technology can provide for the organization (Johnson, 2010; Iacovou et al., 1995). It was measured by using ten questions adapted from Morteza et al. (2011); Al-Qirim (2007); Grandon and Pearson (2004b). The second is *perceived compatibility*, which pertains to what extent e-commerce is compatible with the technology infrastructure, culture, value, and work practice in the organization (Morteza et al., 2011). It was measured by asking seven questions adapted from Morteza et al. (2011), Al-Qirim (2007), Grandon and Pearson (2004b). The third is *cost*, which refers to the expense of e-commerce technology adoption. Four questions were asked to measure this variable, which were adapted from Al-Qirim (2007), Morteza et al. (2011). The fourth was *firm size*, which is measured by three indicators; number of employees, total sales and total assets. These indicators are developed based on Indonesian policies.

The fifth is *technology readiness,* to what extent the technology infrastructure, relevant system and technical skill are available in order to support e-commerce adoption (Zhu et al., 2006). Six questions adapted from Molla and Licker (2005a) were asked to measure this variable.

The sixth, seventh, eighth and ninth variables relate to the external pressure, which refers to the degree of pressure from external parties. In this case the parties are *customer and supplier*; *competitor*, *government* and *technology vendor*. The number of questions asked for each variable (in order) are four, three, two and three questions. The questions used to measure *customer/buyer pressure, competitor pressure* and *technology vendor support* are adopted from Al-Qirim (2007), Morteza et al. (2011), Poon and Swatman (1999), Kuan and Chau (2001),

Thong and Yap (1995). Whilst the questions for *government support* are developed based on the Indonesian condition.

Then, the last three variables are *manager or owner innovativeness*, *manager or owner involvements* and *manager or owner IT knowledge*. The manager or owner innovativeness refers to the degree to which a person adopts the innovation more quickly than others in the similar social context (Roger and Shoemaker, 1971 as cited by Marcati et al. (2008)). It is measured by asking four questions adapted from Thong and Yap (1995), Morteza (2011), Al-Qirim (2007). Then, the manager or owner involvement is defined as the degree of support that is given by manager or owner in e-commerce adoption; and it was measured by using three questions adapted from Al-Qirim (2007). Finally, the manager/owner's knowledge relates to the IT knowledge had by the owners, which measured with nine questions adapted from Thong and Yap (1995), Morteza (2011).

#### *4.4.4.1.2 Translating Questions*

The questionnaire was developed based on the Indonesian situation, but it was drafted in English. Because the target respondents of this questionnaire are Indonesian SMEs, it was translated into the Indonesian language. This translating is important to ensure that the questions asked in this questionnaire are understandable by Indonesian respondents. Besides being understandable, the questionnaire translated must have same meaning with the original one. Accordingly, in the translating process the following factors were considered:

1. "Lexical meaning, which refers to the exact meaning of each word
2. Idiomatic meaning, which relates to the meaning ofgroups of words that are natural to a native speaker and not deducible from those of the individual words
3. Experiential meaning, which refers to the equivalence of meanings of words and sentences for people in their everyday experiences
4. Grammar and syntax, which refers to the correct use of language, including the ordering of words and phrase to create well-formed sentences"

Sources: Saunders et al. (2012: 442)

There are several techniques available to translate the questionnaire, which are ”direct translation”, ”back-translation”, ”parallel translation” and ”mixed techniques” (Saunders et al., 2012). The direct translation means the questionnaire is translated from original form to target form directly. It is a simple and cheapest way to do translation; however it can lead to disparity between the original and target questionnaire (Saunders et al., 2012).

Back-translation means the questionnaire is translated into the target questionnaire and then it is translated back into original one. The results of each process will be compared in order to create a final version. This method overcomes the weakness of previous method; however it is more costly as two or more translators are needed (Saunders et al., 2012).

The parallel translation implies that the translation is conducted by two or more independent translators, and then the results of each translator are compared to create the final version. It results in a good wording of the target questionnaire; however it cannot be ensured that lexical, idiomatic and experiential meaning are kept (Saunders et al., 2012).

The last technique is mixed translation. This technique is combination between the second and the third, in which back translation is conducted by two or more independent translators. The results of each translator are compared to create the final version. this technique is believed can create the best match between original and target questionnaires (Saunders et al., 2012). Hence this technique was chosen in this research to translate the English version of the questionnaire into the Indonesian version.

In this research, the translations were conducted by two independent translators. The first translation was conducted by a team from the Language Centre of Andalas University. This centre is one of the trusted institution in Indonesia, particularly in West Sumatera, with regard to translation services, English-Indonesian-English. Another translation was conducted by two lecturers from the Economic Faculty of Andalas University. All of them had graduated from a Western University, so all of them were able to communicate in both the English

and Indonesian language. The lecturers were not only able to translate the questionnaire, but they were also experts in the Information System field. They are a lecturer in Information System (IS) field with more than 15 years experience, and besides that they also have experience in designing the IS system of several companies in Indonesia. Hence, besides doing translation, they also reviewed the questionnaire in regard to construct validity.

During the translation process, there was no significant difference between both translations made by the language centre and the lecturers. Hence, no major problem occurred in this process.

#### *4.4.4.1.3 Pilot Test*

Even though most of the questions in this questionnaire are adapted from previous studies and these have been translated and reviewed by the experts, this questionnaire still needed to be pilot tested. This procedure was aimed to determine whether the questions were understandable; the questions were placed in good order; can capture the concept being studied; the instructions given were adequate; or whether questions are needed to be added or removed (Saunders et al., 2012).

Saunders et al. (2012) state that there is no exact numbers of people needed to pilot the questionnaire.The numbers depend on research questions, research objectives, the size of research project, the time and resources available and how well the questionnaire is designed. However, Saunders et al. (2012) described that the minimum numbers people in pilot for most student questionnaire are 10; but for large survey are usually 100 to 200 respondents.

In this research, the pilot was carried out with 15 SME owners or managers face to face. Based on the pilot test, minor corrections were applied which related to rephrasing sentences into a simpler and more understandable format. To ensure that the final questionnaire was free from “typos”, a final check was conducted by three PhD students and no errors were found.

The final questionnaire consisted of five sections, which were:

- Section One: General information on the SME. Company name, company address, company e-mail, type industry and number of employees, number of assets and total sales per year.
- Section Two: The condition of e-commerce adoption.
- Section Three: The factors that influence SMEs in the adoption of e-commerce.
- Section Four: Benefits felt by the SME in regard to e-commerce adoption.
- Section Five: Demographic factors, such as gender, age, position and education.

The final questionnaire was transformed into two versions. The first was a Microsoft Word version, which was sent by postal and e-mail, the second was an online version using the Bristol Online Survey. The Word version was printed (obviously) for the postal distribution. Those contacted by e-mail were offered the choice of completing the survey as an e-mail attachment or online though a link.

*4.4.4.1.4 Sampling Method*

As described previously the target respondents of this research are owners or managers of Indonesian SMEs. There is no singular definition of the SME proposed in the literatures. The definition varies among researchers and/or between countries. In regard to this research, the definition of the SME is based on criteria given by the Indonesian Ministry of Cooperatives and Empowerment of Small Medium Enterprises. A business is classified as an SME if it has less than 100 employees, assets less than IDR 10 billion and total sales per year below IDR 50 billion.

In Indonesia, there is no centralised data base that stores information about all SMEs in the country. Most data sources available in Indonesia come from the data which is collected and stored by parties who are interested in SMEs. For example the Indonesian government via the Indonesian Ministry of Cooperative and Empowerment of Small Medium Enterprises (*Kementrian Koperasidan Usaha Kecil Menengah Republik Indonesia*) provides some SME data in specific areas. The data provided by this ministry can be accessed through several

websites: www.depkop.go.id, www.jakarta.go.id, and http://promoukm.com. Besides government, other parties such as research institutes and private organization also provide SME data. This can be accessed in:

- http://www.smartbisnis.co.id,
- http://bisnisukm.com,
- http://www.indotrading.com,
- www.indonetwork.co.id.

Among these data sources, the last website (www.indonetwork.co.id) has more detail and is more complete in providing information of Indonesian SMEs than the others. It provides not only basic information about the SME, such as company name, company address, and main product; but it also provides information about the e-mail address, the number of employees, the owners/managers, the market area and phone numbers.

In this research, a combination between government sources and a private organisation source (www.indonetwork.co.id) was used to determine the sample frame. The government institution data base was used because of its reliability and validity, whilst the private data base was used because of its completeness.

In order to ensure there were no overlapping SMEs on the sample frame, the list of SME were sorted alphabetical by company name. The lists of firms were identified based on information provided. Only the firms which had complete information were considered as part of the sample. By complete information, we mean that the information about the company name, company address, e-mail address and contact number, type of industry, owners, and number of employees are available. After identifying and cleaning the data base, 2,867 firms were chosen as sampling frame for this research.

*4.4.4.1.5 Respondents*

As described earlier in this section, the respondents of this research are an SME owner or manager. The reasons behind this selection are:

1. The decision to adopt or not to adopt IS technology is directly affected by top management. In most cases the CEO (Chief Executive Officer), CIO (Chief Information Officer), and owner are the same person (Thong, 1999).
2. The owner/manager has a key important role in making decision in all business activities, including the decision made about the adoption of any system(s), starting from the planning stage to post implementation stages (Morteza, 2013, Fuller and Lewis, 2002, Mirchandani and Motwani, 2001, Ghobakhloo, 2011).
3. Indonesian SMEs are often owner-manager firms (the owner, manager or employer are the same person).

#### *4.4.4.1.6 Delivering and Collecting the Questionnaire*

As explained previously, postal and internet questionnaires were applied in this research. The online questionnaire was sent by e-mail to respondents, while the postal questionnaire was sent by post office services.

There were 2,667 questionnaires sent to respondents through e-mail during September 2013 to February 2014. Two versions of the questionnaire (the online version and Microsoft Word version) were attached in the e-mail.Sending these two versions allowed the respondent to choose completion in the way that they were most comfortable.

Two reminders were sent (in the middle of October 2013 and in the middle of January 2014) to respondents to increase their participation. During that time, 52 word version questionnaires were received and 289 online version questionnaires were filled. However, due to incomplete data, in which the respondent did not answer all of the questions, 89 of the online questionnaire were dropped.

There were 200 word version questionnaires delivered to respondents by post. Seventy five of questionnaire were returned, however only 49 of them were filled completely. Therefore, in total 301 questionnaires were used in the analysis.

Table 4-5 below summarizes the numbers of questionnaire delivered and returned in this research.

**Table 4-4:** Summary of the numbers of questionnaires delivered and returned

| Description | Total Number | % |
|---|---|---|
| Questionnaire delivered by e-mail | 2,667 | 93. |
| Questionnaire delivered by postal | 200 | 7 |
| Total questionnaire delivered | 2,867 | 100 |
| Questionnaire returned (e-mail and online) | 341 | 81.9 |
| Questionnaire returned (postal) | 75 | 18.1 |
| Total questionnaire returned | 416 | 100 |
| Questionnaire incomplete (e-mail and online) | 89 | 77.3 |
| Questionnaire incomplete (postal) | 26 | 22.7 |
| Total questionnaire incomplete | 115 | 100 |
| Questionnaire completed (e-mail and online) | 252 | 83.7 |
| Questionnaire completed (postal) | 49 | 16.3 |
| Total Questionnaire available to analysis | 301 | 100 |
| Response rate | | 10.5 |

The response rate of this research is 10.5 %. This is similar with the response rate of Govindaraju et al. (2015) study on Indian SMEs, which is 10.75%.

#### *4.4.4.2 Interviews*

As described previously, besides the self-completion questionnaire, this research also used semi-structured interviews to collect the data. This mode was chosen to offset the disadvantages of the other research instrument. The interview allows the researcher to explore respondent's answers by asking a specific questions related to particular subject. The objective is to get a deeper understanding of their opinion.

Saunders et al. (2012) classified interviews into two main categories; standardized and non-standardized. In a standardized interview, questions asked to a respondent are standardized and identical for each respondent. The interviewer needs to read the predetermined set of questions and record the answer on a standardised form (Saunders et al., 2012). This type is recognized as structured interview by Bryman (2012) or as interviewer–administered questionnaire by Saunders et al. (2012).

On the other hand, in the unstandardized interview, there are no standardized/identical set of questions prepared, the interviewer can ask the respondent based on a list of themes and some key questions in different ways or the interview can use informal way or questions in order to explore in depth understanding or knowledge of respondent. The former is known as a semi-structured interview, while the latter is known as unstructured/in-depth interview (Saunders et al., 2012).

The semi-structured interview is more frequently used for explanatory research. It can be used to find out the reason for a decision or the reason for an attitude/opinion about the themes that have been emerged in the questionnaire (Saunders et al., 2012). However, an in-depth interview is more frequently used for exploratory research. It can be used to explore in depth a general area or a new area in which the researcher is interested on (Saunders et al., 2012). Hence, for this research semi-structured interviews were conducted.

Semi-structured interviews can be conducted in three ways; face to face, telephone and internet and intranet mediated interview (Saunders et al., 2012). Because the respondents of this research are dispersed widely throughout Indonesia, a telephone interview was used in this research. Moreover, as suggested by Bryman (2012) the telephone interview also offers several advantages, which are:

a. Cheaper and quicker to administer, especially if respondents spread out geographically.
b. Easier to supervise than a personal interview
c. Can reduce subjectivity, because the interviewer cannot see respondent's appearance, social class or ethnicity.

*4.4.4.2.1 Interview Sampling Method*

There are three important decision related to the sampling for the interview process. First, to decide a suitable sampling size. Second, to the decide a suitable sampling frame, and finally choosing the sample.

In regard to the first decision, research methodology literatures suggests that in deciding a suitable sample frame it is highly depend on the research objective and or research questions, and also the availibity of time and budget. Because in this study the qualitative data is only used to support the quantitative result and the researcher has a limited time, therefore in this study, twenty-two SMEs was targeted to participate in the interview process of this study.

In deciding a suitable sampling frame, it was decided that all of respondents who participated in the questionnaire process can be selected as the sample for interview process. Therefore, a sampling frame for the interview process was 301 respondents.

The later decision related with the decision to select an appropriate sample. Because the interview result is used in this study to support the questionnaire result as mentioned earlier, then in this study the choice of owner/managers involved in interview process was based on their willingness to participate in this step. In this regard, twenty-two owner/managers of SMEs were involved in interview process.

Table 4-5 shows the characteristics of selected firms who participated in interview process. To keep their confidentiality, each of firms was assigned a code.

**Table 4-5**: Firms Who Participated in the Interviews

| No | Company code | gender | Product | Size |
|---|---|---|---|---|
| 1 | I | F | Traditional crackers; clothes and souvenirs | Medium |
| 2 | II | M | Builders equipment | Medium |
| 3 | III | F | Embroidered scarves | Micro |
| 4 | IV | M | Handicraft | Small |
| 5 | V | M | Handicraft | micro |
| 6 | VI | F | Embroidered scarves and clothes | Micro |
| 7 | VII | F | Embroidered scarves and clothes | Small |
| 8 | VIII | F | Clothes | Small |
| 9 | IX | M | Handicraft | Small |
| 10 | X | M | Muslim clothes | Medium |

| No | Company code | gender | Product | Size |
|---|---|---|---|---|
| 11 | XI | M | Fibre products | Medium |
| 12 | XII | M | Woven clothes | Small |
| 13 | XIII | M | Wood handicraft | Medium |
| 14 | XIV | M | Clothes | Small |
| 15 | XV | M | Traditional crackers | Micro |
| 16 | XVI | F | Tailor and designer | Small |
| 17 | XVII | F | Mushrooms cracker | Micro |
| 18 | XVIII | M | Graphic design | Micro |
| 19 | XIX | M | Woven clothes | Small |
| 20 | XX | M | Hat, Bag and sandal | Small |
| 21 | XI | F | Sports clothes | Small |
| 22 | XII | M | Household goods | Medium |

In order to record the interview result, paper and pencil were used to write down the conversation. Telephoning was by a standard land line with no facility to record the conversation. On average, 10-15 minutes conversation were carried out for each respondent. The questions asked in interview were:

1. When did you adopt or plan to adopt e-commerce?
2. What are factors that influenced you in adopting or not-adopting e-commerce?, and why?
3. What are benefits did you expect from e-commerce adoption?
4. What are barriers did you face in the adoption of e-commerce?
5. What are the benefits that you realized during the e-commerce adoption?

Although standardized questions were prepared; in practice, however,the same questions were asked in a different way depending on how the interview progressed. For example, those respondents who did not know about English terms, such as, “e-commerce”, they were asked in different words such as “perdagangan secara elektronik”. Sometimes the conversations were also shifted to a different topic that the respondent was particularly interested about.

#### *4.4.4.3 Measurement*

Measurement is a process done by the researcher in order to measure a concept. Because concepts, as defined by Bryman (2012) are "the building blocks of theory and represent the points around which social research is conducted", is something abstract, therefore they need to be measured, and transformed into something that can be quantified. In regard to this, an indicator is usually used (Bryman, 2012). There are two types of indicators, which are single indicator and multiple indicators. Because the single indicator has several weaknesses, it is suggested that the researcher use multiple indicators (Bryman, 2012). Hence, in this research five-point Likert scales, ranging from 1 (strongly agree) to 5 (strongly disagree), were used to measure the concept being studied.

The following sub section shows the operational definition of each variables in this research and its indicators.

##### *4.4.4.3.1 Perceived benefits*

As described previously, in this research the perceived benefits refer to the degree of acceptance of the possible advantages that e-commerce technology can provide for the organization (Johnson, 2010; Iacovou et al., 1995). There are ten indicators used in this research. The indicator of perceived benefits consist of new opportunity, increased business or individual productivity, time saving, extent market, up to date information and increased profit. The indicators used in this study were adapted from Morteza et al. (2011); Al-Qirim (2007); and Grandon and Pearson (2004b). Afive point Likert scale was used, from 1 (strongly agree) to 5 (strongly disagree).

##### *4.4.4.3.2 Compatibility*

The operational definition for compatibility, in this research, is to what extent e-commerce is accordant with current technology infrastructure, culture, value and work practices in the organization (Morteza et al., 2011). Seven indicators with five point Likert scale are used to measure this variable. The indicators reflect whether the e-commerce technology is accordant with the culture and values, work practices, business activity, the level of safety, legality, customers need and

technology infrastructure of Indonesian SMEs. These indicators were adopted from Morteza et al. (2011), and these were also used byAl-Qirim (2007), Grandon and Pearson (2004b), and Premkumar (2003).

#### *4.4.4.3.3 Cost*

Cost refers to the expenses incurred related to the adoption of e-commerce technology, ranging from the cost for technology infrastructure to the cost for maintenance and training. This variable is measured by asking respondents about their perception in regard to the cost spend for the e-commerce and time needed for the adoption of e-commerce technology. Four questions with five-point Likert scale are asked, and these were adapted from Al-Qirim (2007) and Morteza et al. (2011).

#### *4.4.4.3.4 Firm Size*

The firm size, in this research, is measured by using three indicators, which are number of employees, total sales and total assets. These criteria are presented in Table 4-6 below:

**Table 4-6**: Firm Size Criteria

| No | Indicators | Micro Business | Small Business | Medium Business |
|---|---|---|---|---|
| 1 | Sales per year | ≤ IDR. 300.000.000 | IDR 300.000.000-≤ IDR 2.500.000.000 | IDR 2.500.000.000-≤ IDR. 50.000.000.000 |
| 2 | Asset (land and building are not included | ≤ IDR. 50.000.000 | IDR. 50.000.000 -≤ IDR. 500.000.000 | IDR 500.000.000-≤ IDR 10.000.000.000 |
| 3 | Number of employees | Less than 5 people | 5 to 9 people | 10 to 99 people |

The criteria used above was based on criteria given by Indonesian government.

#### *4.4.4.3.5 Technology Readiness*

Technology readiness is defined in this research as to what extent there is the availability of a technology infrastructure and relevant system and technical skill to support the e-commerce adoption (Zhu et al., 2006). In this case, six indicators were used. Sufficiency of business experience in regard to network application; adequacy of IT human resources; availability of technology of infrastructure; availability of internet connection; flexibility of information system and

customizability of the current system are the six indicators used to measure the technology readiness. All of these were adopted from Molla and Licker (2005a), and a five-point Likert scale was applied.

#### *4.4.4.3.6 Customer/supplier pressure*

In this research, the customer/suppliers pressure refers to the degree of pressure from customer/suppliers felt by Indonesian SMEs in regard to the e-commerce adoption. Four indicators with a five-point Likert scale were used to measure this variable. The first indicator is the level of pressure from industries to adopt e-commerce. The second and the third are the degree of pressure from customers or buyers and suppliers to adopt e-commerce. Then, the last is business partner demand to use the e-commerce technology. These indicators were adopted from Sila (2013), Morteza et al. (2011) and Al-Qirim (2007).

#### *4.4.4.3.7 Competitor pressure*

Competitor pressure is the degree of pressure perceived by Indonesian SMEs that come from their competitor. In this regard, three indicators employing a five-point Likert scale were used to measure it. The indicators are the level of competition among businesses within similar industries, the level of easiness of customers to switch to another company that offers similar product/services, the level of easiness of customers to access several different products or services that have same function in the market. These indicators were also used by Sila (2013), Morteza et al. (2011) and Al-Qirim (2007).

#### *4.4.4.3.8 Government Support*

In this research, government support refers to any support given by government in order to encourage the Indonesian SME in the adoption of the e-commerce. Two indicators were used to measure this variable. The first indicator relates to an availability of government assistance for SMEs in regard to the internet or e-commerce use. Then the second relates to the availability government regulation that encourages the SME in e-commerce adoption. A five-point Likert scale was used for these indicators.

#### *4.4.4.3.9 Technology Vendor Support*

Technology support refers to any support given by a technology vendor in regard to the e-commerce technology adoption. In this case, three indicators were used to measure it. These indicators relate to availability of technology vendor assistance to introduce the e-commerce technology; availability of technical support for the e-commerce use; and availability of sufficient training for the e-commerce use. These indicators were also used by Morteza et al. (2011). A five-point Likert scale was used for these indicators.

#### *4.4.4.3.10 Manager/Owner's Innovativeness*

This refers to the degree to which a person adopts the innovation more quickly than others in the similar social context (Roger and Shoemaker, 1971 as cited by Marcati et al. (2008)). There are four indicators used to measure this variable. These indicators reflect to what extent the SME's owner has original ideas, new innovative, new perspective and bravery to face a risk. These indicators were adopted from Thong and Yap (1995), Morteza et al. (2011), and Al-Qirim (2007)

#### *4.4.4.3.11 Manager/Owner's Involvement*

The manager/owner's involvement refers to the degree of support that is given by the manager/owners in e-commerce adoption. In this regard, three indicators are used. The first two indicators reflect the level of involvement of manager/owners related to e-commerce adoption and e-commerce use, and the third relates to what extent the owners lead a change. These indicators also used a five point Likert scale and were adopted from Al-Qirim (2007).

#### *4.4.4.3.12 Manager/Owner's IT Knowledge*

The owner's IT knowledge refers to the level of IT knowledge of the SME owner. There were nine indicators used to measure this variable. The first five indicators relate to the experience of the SME owner in regard to computer or internet use, and the last four indicators reflect the level of understanding of the SMEs owner regarding specific computer software. These indicators were adopted fromThong and Yap (1995) and Morteza et al. (2011) studies.

#### *4.4.4.3.13 E-commerce adoption*

In this research, e-commerce adoption was measured by using two indicators. The first indicator relates to the level of e-commerce adoption measured by using an e-commerce capability indicator. The indicator is based on the growth model. There are seven level of e-commerce adoption, which are: not connected to internet and no e-mail; connected to the internet with e-mail but no web site; static website; interactive website; transactive web site; internal integrated; and internal and external integrated. This indicator was also used by Molla and Licker (2004) and Molla and Heeks (2007). The second indicator relates to scope of e-commerce use. The scope of e-commerce use refers to "the extent of e-commerce use for a number of different activities in the value chain, from advertising and marketing to sales, procurement, service and support, data exchange with customers and suppliers, and integration of business process" (Gibbs and Kraemer, 2004: 132). In this measurement, respondents are asked about whether they use e-commerce technology in such activities or not.

#### *4.4.4.3.14 Business Performance*

Business performance is a measure used to quantify the success of the business in achieving the objectives that have been set previously. There are two attributes that can be used to measure business performance, which are the primary attribute and a secondary attribute (Molla and Heeks, 2007). The former attribute relates to the objective or quantitative measures of benefits, however the later relates to a subjective measure by using perception-based measures (Molla and Heeks, 2007). It cannot be denied that many authors distrust the subjective perception, however as argued by Molla and Heeks (2007) there is a relationship between the primary and the secondary attributes and there is difficulty to get economic or quantitative measures. Hence the subjective perception measure has been widely used to measure IS benefits or performance. In line with this, Delone (2003) also recognized the use of secondary attributes to measure IS benefits.

Therefore, in this research, the business performance is measured by using several indicators based on the self-reported perception of the SME owners about their

business performance. Sales, cost, customers satisfaction, number of complaints, market share, speed of data processing, company image, internal and external communication were some indicators used in this research to measure SME performance. These indicators were also used by several previous studies, such as Molla and Heeks (2007), Kraemer et al. (2002) and Crag et al. (2002).

#### *4.4.4.4 Validity and Reliability of Measurement*

Validity and reliability of measures are important components of any research. Invalid or unreliable measures lead to inaccuracy in the result and vice versa. Hence, it is important to ensure the validity and reliability of measures used in this research.

##### *4.4.4.4.1 Validity*

Validity refers to the degree in which the measurement developed by researcher is able to capture the concept being studied (Bryman, 2012). Validity can be classified into internal and external validity (Sekaran and Bougie, 2013). Internal validity refers to "the issue of authenticity of the cause and effect relationship" (Sekaran and Bougie, 2013: 225); while external validity refers to the "generalizability of result beyond the focal study" (Easterby-Smith, Thorpe, and Jackson, 2012: 45).

Bryman (2012) classified validity into five categories. Firstly, face validity which relates to whether the measurement developed by researchers seemly reflects the concept being studied or not. It is a minimum level of validity. Usually, face validity might be established by asking people who have an experience or expertise in certain field.

Secondly, concurrent validity which relates to the ability of measurement to distinguish those people who have a knowledge from those who have no knowledge. Next, predictive validity, refers to the ability of a measurement to predict a future condition. Then, construct validity, which relates to how well the measurement met with the theory of the concept. Finally, convergent validity, this

occurs when scores from two different measurement which measure the same concept havea high correlation.

In order to increase the validity of this research, the following procedures were conducted:

1. The questionnaire for this research has been reviewed by two information system experts and has been piloted with fifteen SME managers. It is generally recognized that such procedures can increase both the face validity and construct validity this research.
2. An extensive literature review was conducted in order to define the variable and to determine the scales of the measures. Furthermore, most of questions in this questionnaire were adapted from related studies, in which validity and reliability had been considered.
3. The use of two different data collection methods is believed to increase the validity of this research. The result gathered by the questionnaire method can be validated by the result gathered from the semi-structured interview.

#### *4.4.4.4.2 Reliability*

A Reliability test is conducted to ensure a consistency of the measurement developed by researcher which measures the concept (Bryman, 2012). Generally, there are two aspects used as indicator of reliability, which are stability and internal consistency. Stability refers to the ability of the measurement(s) to measures the concept stably over time (Bryman, 2012). To test it, test-retest can be used. In this test, a respondent will be asked a set of questions in two different situations, if the answer given by the respondent the first time has high correlation with the answer given on the last time it means the measurement is stable and vice versa. The second aspect is internal consistency which relates to whether the index or scales used in the measurement are consistent or not. It can be seen from indicator scores, if individual scores on any one indicator tend to be related with other indicators, it means that internal reliability exist.

The internal consistency can be assessed in several ways; however the most commonly used is Cronbach's Coefficient Alpha. The value of Cronbach's Alpha coefficient ranges from 0 to 1. A greater value indicates a greater reliability. According to Berthoud (2000) as cited by Bryman (2012), a minimum score of Cronbach's Alpha equal to 0.60, can be said to be "good" in respect of internal validity.

Based on data gathered in pilot test, the result of the reliability test of the measures used in this research is presented in Table 4-7 below.

**Table 4-7:** Cronbach's Coefficient Alpha for All Variables

| Variable | Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | Number of Items |
|---|---|---|---|
| Perceived benefit | .894 | .916 | 10 |
| Perceived Compatibility | .793 | .796 | 7 |
| Cost | .944 | .945 | 4 |
| Firm Size | .867 | .867 | 3 |
| Technology readiness | .909 | .910 | 6 |
| Customers/suppliers pressure | .862 | .863 | 4 |
| Competitor pressure | .916 | .917 | 3 |
| Government pressure | .815 | .815 | 2 |
| Support from technology vendor | .947 | .947 | 3 |
| Manager/Owner's innovativeness | .851 | .853 | 4 |
| Manager/Owner's involvement | .954 | .954 | 3 |
| Manager/Owner's knowledge | .824 | .832 | 5 |

The table above shows that the minimum value of Cronbach's Alpha coefficient is .793 (for perceived compatibility) and the maximum value is .954 (for manager/owner's involvement). Overall, the value is more than 0.60. It means the measurement for all variables is considered as reliable.

### 4.4.5 Data Analysis

In general, data analysis in quantitative research refers to a process to apply statistical techniques/logical techniques in order to explain about the relationship or trend of the data. Currently, there are several statistic techniques available for data analysis in quantitative research. To determine which of the techniques it is appropriate ato apply, several factors should be considered by researchers, which are the type of data/variables; research objectives; and size and nature of the sample (Pallant, 2013; Bryman, 2012). Hence, it is important to explain these factors before explaining the choice of statistical techniques.

#### *4.4.5.1 Types of Data*

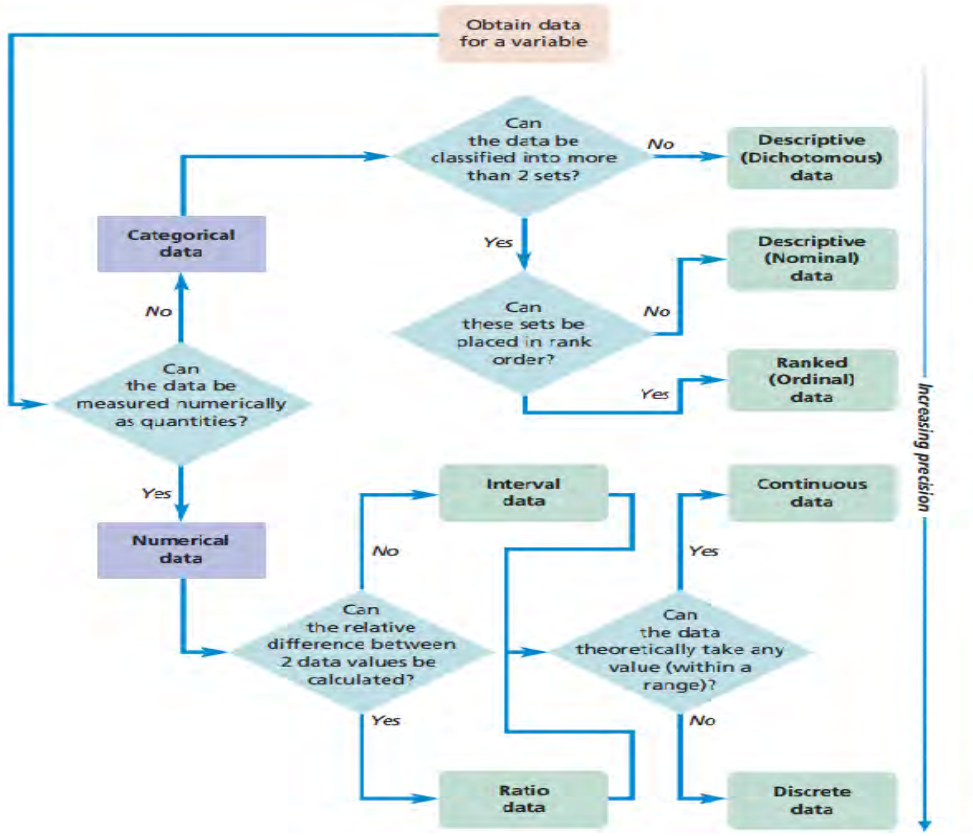
Saunders et al. (2012) classify quantitative data into two main categories; categorical and numerical data. The former refers to "data whose values cannot be measured numerically but can either classified into set (categories) according to the characteristics that identify or describe the variable or place in rank order" (Saunders et al., 2012: 475). This definition implies that the categorical data can be categorized further into two categories, which are descriptive (dichotomous or nominal) data and ranked/ordinal data. In contrast, the numerical data relates to a data which can be measured numerically (Saunders et al., 2012). It can also be divided into two main categories, which are interval data and ordinal data. Figure 4-2 distinguishes each of these types.

Bryman (2012: 336) states the differences between each types in the following descriptions:

- Interval/ratio: variables where the distances between the categories are identical across the range. It can be classified as continuous if those values can theoretically take any value, or as discrete if those values can be measured accurately (Saunders et al., 2012).
- Ordinal: variables whose categories can be rank ordered but the distances between the categories are not equal across the range
- Nominal: variables whose categories cannot be rank ordered; also known as categorical
- Dichotomous: variable containing data that have only two categories

As described in sub section 4.3.4.2, most of variables of this research were measured by using a five-point Likert scale. As suggested by Sekaran and Bougie (2013), the Likert-scale can be categorized as an interval scale, and it can be classified as continuous data (Pallant, 2013). Therefore, this study uses continuous data.

**Figure 4-1**: Defining the data type




Source: Saunders et al. (2012: 476)

### *4.4.5.2 Research Objective*

Besides the type of data, the objectives of the research also determine the choice of statistical technique used in research. In general, Pallant (2013) classifies the objective of research into two main categories, which are to explore the relationship between variables and to explore the differences between groups.

Specifically Pallant (2013) revealed that there are several techniques available to test such objectives. Correlation, partial correlation, multiple regression and factor analysis are statistical techniques that can be used to examine the relationship between variables. On the other hand, t-test, one-way analysis of variance; two way analysis of variance; multivariate analysis of variance or analysis of covariance can be used to test the differences among groups.

As described in section 4.1, there are four objectives of this study. The first objective is to investigate the extent of the adoption of e-commerce by SMEs in Indonesia. The second is to identify the factors that influence SMEs in Indonesia in adopting of e-commerce. The third and the fourth are to identify benefits gathered by SMEs in Indonesia in regard to e-commerce adoption and to investigate the relationship between e-commerce adoption and SMEs performance.

In regard to the last three objectives, fourteen hypotheses are offered in this research, which are:

H1: Perceived benefits positively influence the adoption of e-commerce by the SME

H2: Compatibility positively influences the adoption of e-commerce by the SME

H3: Cost negatively influences the adoption of e-commerce by the SME

H4: Technology readiness positively influences the adoption of e-commerce by the SME

H5: Firm size positively influences the adoption of e-commerce by the SME

H6: Customers/suppliers pressure positively influences the adoption of e-commerce by the SME

H7: Competitor pressure positively influences the adoption of e-commerce by the SME

H8: Government support positively influences the adoption of e-commerce by the SME

H9: Technology vendor support positively influences the adoption of e-commerce by the SME

H10: Owners innovativeness positively influences the adoption of e-commerce by the SME

H11: Owners involvement positively influences the adoption of e-commerce by the SME

H12: Owners IT knowledge positively influences the adoption of e-commerce by the SME

H13: The higher the level of e-commerce adoption by an SME, the more likely for that SME to gather the greater benefits of the e-commerce

H14: E-commerce adoption by an SME positively influences that SME's performance

It can be seen from the hypotheses above that the hypotheses of this research mainly fall on the first category which is to examine the relationship between independent and dependent variables and only one of hypothesis (H13) falls into the second category, which is to to explore the difference between groups.

#### *4.4.5.3 Size of Sample*

Another factor which determines the choice of statistical techniques is a size of sample. For certain statistical techniques, a minimum sample size is required. For example, for multiple correlation, at least 50+8m (m refers to the number of independent variables) samples are required; while 104+m samples are required for testing an individual predictor (Pallant, 2013). Then Pallant (2013) also suggests to using non parametric tests, such as Chi-square, Mann-Whitney U test or others, for research with small samples. Therefore, it implies that the sample size is also one of factors that should be considered in the choosing of statistical techniques used in a research.

As described in sub section 4.4.4.1.4 above, the sample size for this research is 301 cases. According to criteria given by Pallant above, this number is certainly large enough to apply parametric techniques.

#### *4.4.5.4 Statistical Techniques*

Based on a combination of the characteristics of data types, research objectives and sample size, Pallant (2013) summarized several statistical techniques available for certain characteristics. The summary is presented in Table 4-9.

Table 4-8 shows that the statistical technique suitable for researchaiming to explore the relationship between variables, which used a set of continuous variables, and with a large enough sample, is multiple regression. Whilst the statistical technique for research that aimed to explore the difference between groups, which used a categorical variable, is a one way between group ANOVA.

Hence, in this study, the multiple regression technique was used in order to test the hypotheses H1 to H12 and hypothesis 14 (H14), while one way ANOVA was used to test the hypothesis H13.

**Table 4-8:** Some Statistical Techniques

| Objective | Independent variable (type of data) | Dependent variable (type of data) | Parametric | Non-Parametric Alternative |
|---|---|---|---|---|
| To explore the relationships between variables | One categorical | One categorical | None | Chi-square |
| | Two continuous | | Pearson product-moment correlation coefficient | Spearman's rank order correlation (rho) |
| | Two continuous variables and one continuous variable for which to control | | Partial correlation | none |
| | Set of two or more continuous independent variable | One continuous | Multiple regression | None |
| | Set of related continuous variables | | Factor analysis | None |
| | Set of related continuous variable | one categorical (two categories/dichotomous) | Logistic regression | |
| | Set of related continuous variable | one categorical (three or more categories) | Multinomial regression | |
| To explore the differences between groups | One categorical | One categorical | None | Chi-square |
| | One categorical (two levels) Time1/time2 | One continuous | Paired sample t-test | Wilcoxon Signed Rank Test |
| | One categorical (three or more levels) | One continuous | one way between group ANOVA | Kruskal-Wallis test |
| | One categorical (three or more levels) Time1/time2/time3 | One continuous | Two-way repeated measures ANOVA | Friedman Test |
| | Two categorical (two or more levels) | One continuous | Two-way between group ANOVA | None |
| | One or more categorical | Two or more related continuous | Multivariate ANOVA (MANOVA) | None |
| | One or more categorical | One continuous | Analysis of covariance (ANCOVA) | none |

Source: Pallant (2013: 123-124)

Multiple Regression analysis is one of the statistical tools used to examine the relationship between independent variable and dependent variables. Independent variables refer to variables that influence the dependent variables and explains its variance (Sekaran and Bougie, 2013); while the dependent variable refers to the variable of primary interest to the researcher (Sekaran and Bougie, 2013: 69).

The multiple regressions can be described by using the equation below:

$Y= \alpha + \beta_1X_1 +\beta_2X_2 + \beta_3X_3 + \beta_4X_4 +...+\beta_nX_n$

Where:

Y is dependent variable

αis the regression constant

β is the beta coefficients

X is independent variable

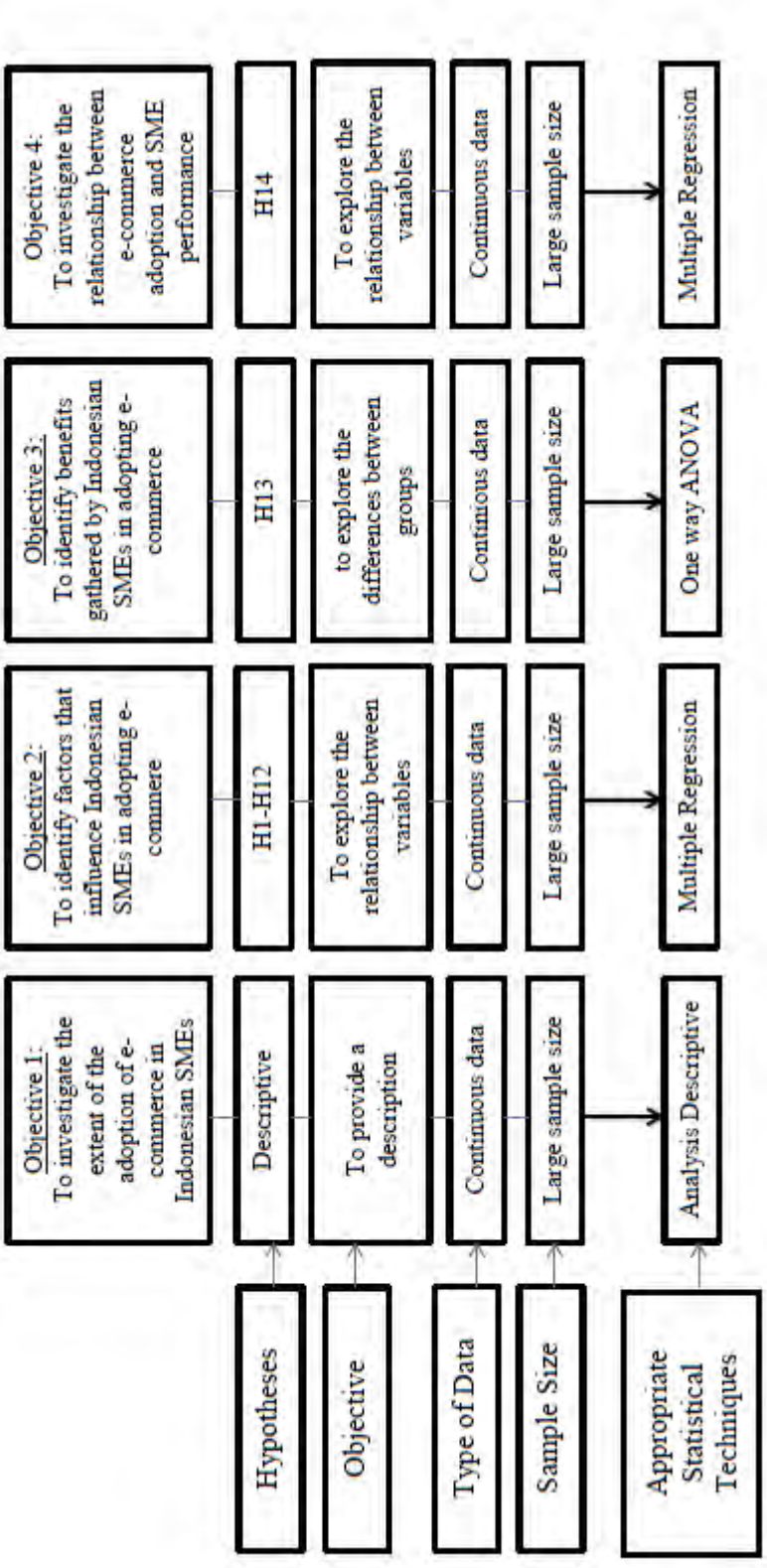
In this research, as described previously, there are twelve independent variables proposed, which are perceived benefit (PB); compatibility (CP); cost (Cs); firm size (FS); technology readiness(TR); customer and supplier pressure (CsP); competitor pressure (CP); government pressure (GP); technology vendor support (TVP); manager/owner's innovativeness (Inn), manager/owner's involvement (Inv) and manager/owner's IT knowledge (ITk); and one dependent variable, which is e-commerce adoption (EC).

Then, one way ANOVA is one of statistical tool that can be used to compare the mean scores of more than two different group (Pallant, 2013). In this regard, a mean score of e-commerce benefits perceived by SMEs in different levels of e-commerce adoption was compared.

Besides multiple regression and one way ANOVA, descriptive analysis was also used in this research in order to explain and summarize respondent's demographic and current condition of e-commerce adoption. The descriptive analyses used in this research are means, frequencies, and standard deviation of the responses.

To sum up, the selection of statistical techniques applied in this study can be described in the Figure 4-3 below:

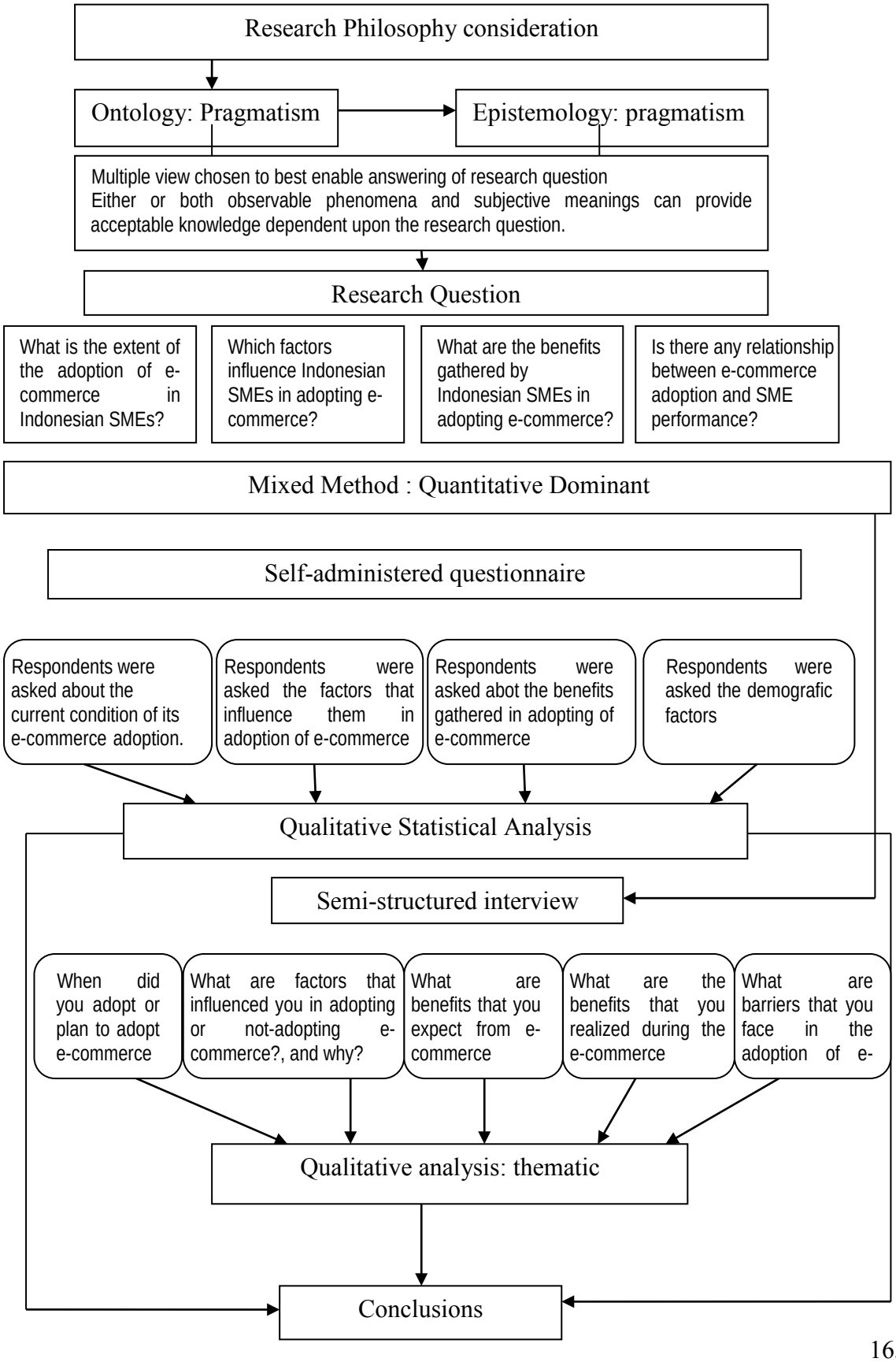
**Figure 4-2 :** Summary of the Selection of Statistical Techniques Applied in This Study



## 4.5 CONCLUSION

This chapter has described both the research methodology used in this study and the underlying research philosophy. This chapter begun by pointing out the research objective and the research question, followed by explaining the ontological and epistemological considerations. Both the ontological and epistemological consideration determined the methodology and method chosen in this research. Both research methodology and research method were described in the design. Alongside discussing research methodology and method, the research design section discussed also research strategy, time horizon, along with the data collection and data analysis used in this research. The summary of the reseach design of this study is presented in Figure 4-4 below.

**Figure 4-4:** Summary of The Research Design



# CHAPTER 5: PRESENTATION OF THE FINDINGS

## 5.0 INTRODUCTION

This chapter presents the findings of this research. It starts by describing the sample profile, both for the SMEs and the respondents in section 5.1. Then, in section 5.2, the current condition of e-commerce adoption by SME in Indonesia is demonstrated. In this regard, e-commerce adopters and non e-commerce adopters profile are explained separately in two sub sections.

Section 5.3 describes the hypothesis testing regarding the determinant factors of e-commerce adoption by Indonesian SMEs. In this case, multiple regression analysis is used. Section 5.4 is about the benefits perceived by Indonesian SMEs regarding e-commerce adoption, and it is followed by presenting the hypothesis testing results in regard to the impact of the e-commerce adoption on the SMEs performance in section 5.5. Then, section 5.6 section summarises this chapter.

## 5.1 SAMPLE PROFILE

### 5.1.1 Profile of the SMEs

As described in Chapter Four, this research sample is SMEs in Indonesia.Three hundred and one SMEs participated in this study. This sub section provides basic information about the SMEs which participated in this study. It includes the firm size and the type of industry.

#### *5.1.1.1 Firm Size*

According to the *Indonesian Ministry of Cooperatives and Empowerment of Small Medium Enterprises*, the SME in Indonesia can be categorized into three main groups, which are micro, small and medium. Table 5-1 below presents the firm size of the SMEs who participated in this study.

**Table 5-1**: Firm Size

| Firm Size | Frequency | Percentage |
|---|---|---|
| Micro | 104 | 34.6 |
| Small | 146 | 48.5 |
| Medium | 51 | 16.9 |
| Total | 301 | 100 |

From the table above, it can be seen that 104 respondents came from micro businesses, which contributed 34.6% of the sample population, 146 respondents (48.5%) are small businesses, and the remaining are medium businesses (51 in number or 16.9 %). This proportion is considered representative of the actual proportion of the SMEs in Indonesia, because based on data provided by the *Indonesian Ministry of Cooperatives and Empowerment of Small Medium Enterprises* the numbers of micro and small businesses are greater than medium sized businesses.

#### *5.1.1.2 Type of Industries*

Table 5-2 below presents the type of industry for the SMEs who participated in this study.

**Table 5-2**: Type of industries

| Type of industry | Frequency | Percentage |
|---|---|---|
| Agribusiness | 7 | 2.3 |
| Manufacture | 74 | 24.6 |
| Electricity, gas and water supply | 1 | 0.3 |
| Construction | 5 | 1.7 |
| Trade, hotel and restaurant | 154 | 51.1 |
| Transport & communication | 2 | 0.7 |
| Finance, rent & service | 55 | 18.3 |
| Others | 3 | 1.0 |
| Total | 301 | 100 |

More than half of total respondents are SMEs in *Trade, Hotel and Restaurant* industry sectors (154 SMEs), then followed by SMEs from *Manufacturing* industry (74 SMEs), *Finance, Rent and Service, Agribusiness* (55 SMEs), *Agribusiness* (7 SMEs), *Construction* (5 SMEs); and the remaining are from *Transport and Communication, the Electricity, Gas and Water Supply*. The table above shows that SMEs from *Trade, Hotel and Restaurant, Manufacturing* and *Finance, Rent and Service* industry dominated the number of SMEs who participated in this study. It is not suprising because based on data provided by *Indonesian Ministry of Cooperatives and Empowerment of Small Medium*

*Enterprise,* these industries are the four main sectors in which the majority of Indonesian SMEs are involved.

#### *5.1.1.3 Location*

Most of the SMEs who participated in this study were based on Java island, which contributed 78.4% or 236 SMEs. It is followed by those SMEs who were based on Sumatera Island (50 SMEs or 16.6 %), Bali (9 SMEs or 3%), Sulawesi Island (3 SMEs or 1%) and the rest were on Lombok and Kalimantan. This is not surprising, because in reality more than 50% of Indonesian SMEs are located on Java Island. For more detail, Table 5-3 below presents the location of the SMEs.

**Table 5-3**: Location

| Location | Frequency | Percentage |
|---|---|---|
| Sumatera | 50 | 16.6 |
| Java | 236 | 78.4 |
| Bali | 9 | 3.0 |
| Lombok | 2 | 0.7 |
| Kalimantan | 1 | 0.3 |
| Sulawesi | 3 | 1.0 |
| Total | 301 | 100 |

### 5.1.2 Profile of the Respondents

It was stated in Chapter Four that the respondents of this research are the owner or manager of the SMEs. This part provides information about the respondents in detail, including their gender, their age and their education.

#### *5.1.2.1 Respondents' gender*

Table 5-4 below portrays the gender of respondents.

**Table 5-4**: Respondents' Gender

| Gender | Frequency | Percentage |
|---|---|---|
| Male | 218 | 72.4 |
| Female | 83 | 27.6 |
| Total | 301 | 100 |

The table shows that the respondents participated in this study are dominated by males, who contribute 72.4% of the sample population (218 people), while female respondents contribute 27.6% or 83 people. It can be seen from the table above that the male owner/manager dominate in this sample profile. It is reasonable because according to World Bank Enterprise survey (Mourougane, 2012), the percentage of male managers in Indonesia exceeds female managers.

#### *5.1.2.2 Respondents' Age*

In regard to age, 34 respondents (11.3%) are under 25 years old; 116 respondents (38.5%) are 25-34 years old; 116 respondents (38.5%) are 35-44 years old; 32 respondents (10.6%) are 45-55 years old; and of the remaining, three respondents (1%), are above 55 years old. Table 5-5 shows in detail the age of respondents participated in this study.

**Table 5-5**: Respondents' Age

| Age | Frequency | Percentage |
|---|---|---|
| under 25 years old | 34 | 11.3 |
| 25 - 34 years old | 116 | 38.5 |
| 35 - 44 years old | 116 | 38.5 |
| 45 - 55 years old | 32 | 10.6 |
| above 55 years old | 3 | 1.0 |
| Total | 301 | 100 |

It can be seen from the table above that the respondents between the ages 25 to 44 dominate, which indicates that the majority of SMEs owners/managers in Indonesia are aged between 25-44 years old.

#### *5.1.2.3 Respondents' Education*

The respondents' educationis presented in Table 5-6 below.

**Table 5-6**: Respondents' Education

| Education | Frequency | Percentage |
|---|---|---|
| Junior High School | 6 | 2.0 |
| Senior High School | 53 | 17.6 |
| Diploma | 53 | 17.6 |
| Undergraduate | 169 | 56.1 |

| Education | Frequency | Percentage |
|---|---|---|
| Master | 18 | 6.0 |
| Doctoral | 2 | .7 |
| Total | 301 | 100 |

From the table above, it can be seen that the respondents are dominated by people who graduated from the undergraduate level, that is 169 people (56.1%), followed by people who graduated from diploma and senior high school which are 53 people (17.6%); Senior High School, 53 people (17.6%); Master, 18 people (6%); Junior high school, six people (2%); and doctoral degree, two people (0.7%). The table above indicates that mostly the SMEs owners/managers are well educated people.

## 5.2 E-COMMERCE ADOPTION BY SMEs IN INDONESIA

### 5.2.1 Questionnaire Findings

This section is intended to describe the research finding related to the first research objective, which is to investigate the level of e-commerce adoption by SMEs in Indonesia. Based on the data gathered from the 301 SMEs, it was found that currently 280 of SMEs are already connected to the internet, and at least, they already have, or use, e-mail in their business activities. On the other hand, there are 21 SMEs that have not connected yet to the internet and they do not have or use e-mail.

The former, in this research, are considered as e-commerce adopters, and the latter are recognized as non e-commerce adopters. Both e-commerce adopters and non e-commerce adopters will be explained in detail sequentially in the following sub sections.

#### *5.2.1.1 E-commerce Adopters*

As described earlier, there are 280 SMEs that have already been connected with the internet and have an e-mail. As explained by Tailor and Murphy (2004), the business that is already using e-mail in their activities can be considered to be at the very basic stage of e-commerce adoption. It means that the 93% of

respondents in this research are e-commerce adopters. The e-commerce adopters, in this research, will be further classified based on two models, which are the *E-business Stage of Growth* model which is proposed by Prananto et al. (2004) and the *Adoption Ladder* which was used by Taylor and Murphy (2004). The classification is started from a very basic level, which is e-mail adopter, up to a sophisticated level such as internal or external integration. Table 5-7 below presents the current condition of e-commerce adoption by Indonesian SMEs.

**Table 5-7**: The level of e-commerce adoption in SMEs

| Level | Frequency | Percentage |
|---|---|---|
| E-mail | 64 | 22.9 |
| Static website | 100 | 35.7 |
| Interactive website | 74 | 26.4 |
| Transactive website | 40 | 14.3 |
| Internal integration | 2 | 0.7 |
| External integration | 0 | 0 |
| Total | 280 | 100 |

From the table above, it can be seen that 64 SMEs (22.9%) are at a very basic stage of e-commerce adoption, which only have and use an e-mail in their business activities. 100 SMEs (35.7%) already have a *static website*. The static website refers to the website that just allows business to provide information (company information or product or services available) without allowing them to carry out two way communication with other parties.

Seventy-four of the SMEs (26.4%) in this research already have an *interactive website*, which allows business to do two way communication, but it does not allowing them to do financial transactions. Then, 40 SMEs already have a web site that allows business not only to do two way communication but it also allows business to do financial transaction, which is recognized as at *transactive website stage*. Two of the SMEs are at an *internal integration* level. Among the SMEs who participated in this research, none of them are at the top level of e-commerce adoption, which is the external integration level.

#### *5.2.1.1.1 Profile of E-mail Adopter*

*Firm Size*

As mentioned previously, 64 SMEs already have and use e-mail in their business activities. They are, in this research, called e-mail adopters. Among the 64 e-mail adopters, 26 (40.6%) of them are micro businesses; 27 (42.2%) are small businesses and 11 (17.2%) are medium size businesses. For more detail, Table 5-8 presents the number of micro, small and medium size business enterprises who already have and use e-mail.

**Table 5-8:** The numbers of SMEs who already have and use e-mail

| Firm Size | Unit | Percentage |
|---|---|---|
| Micro | 26 | 40.6 |
| Small | 27 | 42.2 |
| Medium | 11 | 17.2 |
| Total | 64 | 100 |

*Type of Industry*

In this study, 34 SMEs, who identified as e-mail adopters, are from *Trade, Hotel and Restaurant* industries, 17 SMEs are from *Manufacturing* industries, nine SMEs are from *Finance, Rent and Services* industries, two SMEs are from the *Construction* industry and one SME is from the *Agribusiness* industry. Table 5-9 presents the industry type of e-mail adopter.

**Table 5-9**: Type of Industry

| Type of Industry | Unit | Percentage |
|---|---|---|
| Agribusiness | 1 | 1.6 |
| Manufacture | 17 | 26.6 |
| Construction | 2 | 03.1 |
| Trade, hotel and restaurant | 34 | 53.1 |
| Transport & communication | 1 | 1.6 |
| Finance, rent & service | 9 | 14.1 |
| Total | 64 | 100 |

*Cross Tabulation of Firm Size and IndustryTypes*

In order to get detailed information about the profile of e-mail adopters, both Tables 5-8 and 5-9 were crossed tabulated, and the result is presented in Table 5-10.

**Table 5-10**: Cross Tabulation between Firm size and Industry Type

| | Industry Type | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | Agribusiness | Manufacture | Construction | Trade, hotel and restaurant | Transport & communication | Finance, rent & service | Others | |
| Micro | 1 | 8 | 0 | 13 | 0 | 4 | 0 | 26 |
| Small | 0 | 6 | 2 | 15 | 1 | 3 | 0 | 27 |
| Medium | 0 | 3 | 0 | 6 | 0 | 2 | 0 | 11 |
| Total | 1 | 17 | 2 | 34 | 1 | 9 | 0 | 64 |

The table shows that e-mail adopters are dominated by small businesses in *Trade, Hotel and Restaurant* industries. It is followed by micro businesses in the same industries, then micro businesses in *Manufacturing* industry, small businesses in the *Trade, Hotel and Restaurant* and the *Manufacturing* industries.

*Length of E-mail Use*

This study also shows that the length of e-mail use by SMEs varies, starting from one year or less to six years or more. Table 5-11 describes the length of time of e-mail use by SMEs.

**Table 5-11:** Length of Time of E-mail use

| | Time | | | | Total |
|---|---|---|---|---|---|
| | 1 year or less | 2 or 3 years | 4 or 5 years | 6 years and more | |
| Micro | 9 | 12 | 2 | 3 | 26 |
| Small | 6 | 15 | 4 | 2 | 27 |
| Medium | 1 | 9 | 1 | 0 | 11 |
| Total | 16 | 36 | 7 | 5 | 64 |

It seems that mostly the SMEs, which comprise of 12 micro businesses; 15 small businesses; and nine medium businesses, have used e-mail since two or three years ago. Then, 16 of SMEs, which contain nine micro businesses; six small businesses; and one medium business, have used it for one year ago or less. Seven SMEs, which consist: two micro businesses; four small businesses; and one medium business, have used it since four or five years ago. The remaining, which are three micro businesses and two small businesses, have used it since six years ago or more.

In regard to industry types, the SMEs in the *Trade, Hotel and Restaurant*; *Manufacture*; *Transport & Communication; and Finance, Rent and Services* industries have already used the e-mail since six or more years ago. The SME in the *Agribusiness* industry, on the other hand, just used it a year ago. Then, the SMEs in *Construction* industry have adopted e-mail since four or five years ago. For more detail, Table 5-12 below presents the detail of the length of e-mail use in several industry types.

**Table 5-12**: The Length of E-mail Use in Several Industry Types

| Industry Type | Time | | | | Total |
|---|---|---|---|---|---|
| | 1 year or less | 2 or 3 years | 4 or 5 years | 6 years and more | |
| Agribusiness | 1 | 0 | 0 | 0 | 1 |
| Manufacture | 3 | 9 | 2 | 3 | 17 |
| Construction | 0 | 1 | 1 | 0 | 2 |
| Trade, hotel and restaurant | 7 | 15 | 5 | 7 | 34 |
| Transport & communication | 0 | 0 | 0 | 1 | 1 |
| Finance, rent & service | 2 | 2 | 3 | 2 | 9 |
| Total | 13 | 27 | 11 | 13 | 64 |

*The Number of IT Personnel*

Besides the duration of e-commerce use, this research also asked about the number of IT personnel employed by the SMEs. The results are presented in Table 5-13 below.

**Table 5-13**: The number of IT personnel in SMEs

| | IT Personnel | | | | Total |
|---|---|---|---|---|---|
| | None | 1-2 people | 3-5 people | More than 5 people | |
| Micro | 10 | 15 | 1 | 0 | 26 |
| Small | 11 | 11 | 5 | 0 | 27 |
| Medium | 2 | 3 | 4 | 2 | 11 |
| Total | 23 | 29 | 10 | 2 | 64 |

The table above shows that mostly micro businesses do not have, or only have, one or two IT personnel to handle their information system. Only one of micro business employs more than three IT personnel. A similar situation is also shown for small businesses, where most of them do not have any or only have one or two IT personnel. Only five small businesses employ three or more IT specialists. The medium sized businesses, on the other hand, are seen already to have three or more IT personnel, and some of them have even more.

*The Use of E-mail*

The use of e-mail in SME business activities varies. Mostly, marketing activities purposes dominate the e-mail use by SMEs. Table 5-14 below presents the activities involved in e-mail use.

**Table 5-14**: The activity involved in E-mail Use

| Activities | Number of SMEs |
|---|---|
| Logistic and Distribution activities | 9 |
| Financial activities | 18 |
| Purchasing and procurement activities | 19 |
| Operational and Processing activities | 10 |
| Marketing activities | 49 |
| After sales services activities | 8 |

From the table, it can be seen that nine SMEs reported that they used e-mail in logistic and delivery activities. Then, 18 SMEs use e-mail in financial activities, 19 SMEs use in purchasing and procurement activities, ten SMEs use e-mail for operational and processing activities, 49 SMEs use in marketing activities and eight SMEs use in after sales activities.

#### *5.2.1.1.2 Profile of Static Website Adopter*

As described previously, the static website refers to the website that just allows business to provide information 'one way'. In this research, there are 100 SMEs that already have a static website. The details of these SMEs are described in the following sub section.

*Firm Size*

The static website adopters are dominated by small businesses with nearly half of them being small businesses. Whilst the micro businesses accounted for 33%, followed by medium businesses that contribute 18%. Table 5-15 below presents this result in detail.

**Table 5-15**: The number of SMEs who already have static website

| Firm Size | Unit | Percentage |
|---|---|---|
| Micro | 33 | 33 |
| Small | 49 | 49 |
| Medium | 18 | 18 |
| Total | 100 | 100 |

*Type of Industry*

In this study, website adopters are dominated by the SMEs from the *Trade, Hotel and Restaurant* industries. Then it is followed by the SMEs from the *Manufacturing*industry, and the *Finance, Rent and Services* industry. Only a small portion of the static website adopters are from *Agribusiness*, *Construction, Transport & Communication industries.* The following table describes the type of industry of the static website adopters.

**Table 5-16:** Type of Industry

| Type of Industry | Unit | Percentage |
|---|---|---|
| Agribusiness | 1 | 1 |
| Manufacture | 27 | 27 |
| Construction | 2 | 2 |
| Trade, hotel and restaurant | 42 | 42 |
| Transport & communication | 1 | 1 |
| Finance, rent & service | 26 | 26 |

| Type of Industry | Unit | Percentage |
|---|---|---|
| Others | 1 | 1 |
| Total | 100 | 100 |

*Cross Tabulation of Firm Size and Industry types*

Table 5-17 presents the cross tabulation between firm size and industry type of the static website adopter. The table shows that the micro and small businesses from *Trade, Hotel and Restaurant* industry dominate the static website adopters. Each of them contributes 17% of the total number of static website adopters. The second position is small businesses from *Manufacturing* industry, which contribute 15% of static website adopters. It is followed by small businesses from the *Finance, Rent and Services* industry (14%), micro businesses from the *Finance, Rent and Services* industry (9%), medium businesses from *Trade, Hotel and Restaurant* industry (8%), medium businesses from the *Manufacturing* industry (7%), micro businesses from the *Manufacturing* industry (5%), and the rests are SMEs from *Agribusiness*, *Construction* and *Transport & Communication* industries.

**Table 5-17:** The cross tabulation of firm size and industry types

| | Industry Type | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | Agribusiness | Manufacture | Construction | Trade, hotel and restaurant | Transport & communication | Finance, rent & service | others | |
| Micro | 1 | 5 | 0 | 17 | 0 | 9 | 1 | 33 |
| Small | 0 | 15 | 2 | 17 | 1 | 14 | 0 | 49 |
| Medium | 0 | 7 | 0 | 8 | 0 | 3 | 0 | 18 |
| Total | 1 | 27 | 2 | 42 | 1 | 26 | 1 | 100 |

*The Length of Static Website Adoption*

In this study, mostly the SMEs have had a static website for two or three years. Only few of them have already had a static website for more than six years. The

detail of the length of having this website by SMEs can be seen in Table 5-18 below.

**Table 5-18**: The Length of Static Website Adoption

| | Time | | | | Total |
|---|---|---|---|---|---|
| | 1 year or less | 2 or 3 years | 4 or 5 years | 6 years and more | |
| Micro | 9 | 17 | 5 | 2 | 33 |
| Small | 5 | 28 | 7 | 9 | 49 |
| Medium | 1 | 10 | 6 | 1 | 18 |
| Total | 15 | 55 | 18 | 12 | 100 |

The table above shows that more than half of SMEs (55 SMEs), have had a static website since two or three years ago. Then, 18 SMEs have had a website since four or five years ago, and 12 SMEs already have for more than six years. While the 15 SMEs just have this website for less than one year.

In regard to type of industry, it is found that SMEs from the *Trade, Hotel and Restaurant; Manufacturing; and Finance, Rent & Services* industries have had a static website for longer compared to the SMEs from the other industries, such as *Agribusiness, Construction*, and the *Transport and Communication* industries. The detail of this is given in Table 5-19 below.

**Table 5-19**: The Length of Static Website Adoption in Several Industry Types

| Industry Type | Time | | | | Total |
|---|---|---|---|---|---|
| | 1 year or less | 2 or 3 years | 4 or 5 years | More than 5 years | |
| Agribusiness | 1 | 0 | 0 | 0 | 1 |
| Manufacture | 3 | 16 | 5 | 3 | 27 |
| Construction | 0 | 2 | 0 | 0 | 2 |
| Trade, hotel and restaurant | 8 | 22 | 9 | 3 | 42 |
| Transport & communication | 0 | 1 | 0 | 0 | 1 |
| Finance, rent & service | 2 | 14 | 4 | 6 | 26 |
| Others | 1 | 0 | 0 | 0 | 1 |
| Total | 15 | 55 | 18 | 12 | 100 |

The table shows that the SME from the *Agribusiness* industry has had a static website for just a year. Then, the two SMEs from *Construction* industry and

*Transportation & Communication* industries have had a website since two or three years ago. This is in contrast to those industries, the SMEs from the *Trade, Hotel and Restaurant; Manufacturing; and Finance, Rent & Services* industries who are seen to have had a website longer. Some of them have had this website for four years and some of them even longer (more than six years). However, the table also shows that mostly the SMEs have had this website for two or three years.

*The number of IT Personnel*

Regarding IT personnel, this research found that 33% of the SMEs do not employ an IT specialist, while the rest of them (67%) have employed at least one IT specialist. For more detail, Table 5-20 presents the IT personnel employed by the SMEs.

**Table 5-20**: The Number of IT Personnel

| | IT Personnel | | | | Total |
|---|---|---|---|---|---|
| | None | 1-2 people | 3-5 people | More than 5 | |
| Micro | 14 | 15 | 3 | 1 | 33 |
| Small | 17 | 24 | 6 | 2 | 49 |
| Medium | 2 | 12 | 2 | 2 | 18 |
| Total | 33 | 51 | 11 | 5 | 100 |

The table shows that more than half of the SMEs (51 SMEs) have employed one to two IT personnel in order to handle their IT activities. It is also shown that 11 SMEs have employed three to five IT personnel and only few of the SMEs (five SMEs) have more than five IT specialists.

*The Use of IT by Static Website Adopter*

This research found that the marketing activities are ranked on the first position in term of the use of information technology (IT) by SMEs. The second place is after sales services activities, and it is followed by purchasing and procurement activities, logistics and distribution activities, financial activities and operational and processing activities. In more detail, Table 5-21 reports this result.

**Table 5-21**: The Use of Static Website

| Activities | Number of SMEs |
|---|---|
| Logistics and Distribution activities | 23 |
| Financial activities | 21 |
| Purchasing and procurement activities | 28 |
| Operational and Processing activities | 14 |
| Marketing activities | 86 |
| After sales services activities | 29 |

#### *5.2.1.1.3 Profile of Interactive Website Adopters*

In this research *interactive website* refers to the website that allows the business to provide not only information but also allows a business to communicatewith their supplier or customers (two way communication). There are 74 SMEs who participated in this research who have an interactive websites. In this research they are recognized as interactive website adopters. The profile of the interactive website adopters will be explained in detail in following sub sections.

*Firm Size*

Table 5-22 below demonstrates the firm size of the interactive website adopters.

**Table 5-22**: Interactive Website Adopters

| Firm Size | Unit | Percentage |
|---|---|---|
| Micro | 27 | 36.5 |
| Small | 33 | 44.6 |
| Medium | 14 | 18.9 |
| Total | 74 | 100 |

It shows that the interactive website adopters are dominated by small businesses. There are 33 small businesses that identified themselves as interactive website adopters. The number of micro businesses is reasonably similar, they contribute 36.5% (27) of interactive website adopters. The rest of interactive website adopters are medium sized businesses, fourteen of them (18.9%).

*Type of industry*

Similar to previous adopters (e-mail and static website adopters), the interactive website adopters are also dominated by the SMEs from the *Trade, Hotel and Restaurant* industry. Then, it is followed by the SMEs from the *Manufacturing* industry and the *Finance, Rent and Services* industries. Table 5-23 gives more detailed the information about this.

**Table 5-23**: Type of Industry

| Type of Industry | Unit | Percentage |
|---|---|---|
| Agribusiness | 1 | 1.4 |
| Manufacture | 17 | 23.0 |
| Construction | 1 | 1.4 |
| Trade, hotel and restaurant | 44 | 59.5 |
| Transport & communication | 0 | 0.0 |
| Finance, rent & service | 10 | 13.5 |
| Others | 1 | 1.4 |
| Total | 74 | 100 |

*Cross Tabulation between Firm Size and Industry Types*

Table 5-24 below demonstrates the cross tabulation between Tables 5-22 and 5-23.

**Table 5-24:** Cross Tabulation between Firm Size and Industry Types

| | Industry Type | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | Agribusiness | Manufacture | Construction | Trade, hotel and restaurant | Finance, rent & service | others | |
| Micro | 1 | 3 | 0 | 17 | 6 | 0 | 27 |
| Small | 0 | 7 | 0 | 23 | 3 | 0 | 33 |
| Medium | 0 | 7 | 1 | 4 | 1 | 1 | 14 |
| Total | 1 | 17 | 1 | 44 | 10 | 1 | 74 |

The table above shows that mostly the interactive website adopters are micro and small businesses that come from the *Trade, Hotel and Restaurant* industry. Then,

comparing to others industries, such as *Agribusiness, Construction* and the *Transport & Communication* industry, the number of interactive website adoption by the small and medium businesses from manufacturing industry and finance and rent and service industry are higher

*Length of Interactive Website Adoption*

This research found that mostly the interactive website has been adopted by SMEs in Indonesia for less than three years. Only a few of SMEs have had an interactive website for more than four years. The data about the length of interactive website adoption can be seen in Table 5-25 below.

**Table 5-25**: Length of Interactive Website Adoption

| Firm Size | Time | | | | Total |
|---|---|---|---|---|---|
| | 1 year or less | 2 or 3 years | 4 or 5 years | 6 years and more | |
| Micro | 10 | 15 | 2 | 0 | 27 |
| Small | 13 | 12 | 6 | 2 | 33 |
| Medium | 3 | 8 | 1 | 2 | 14 |
| Total | 26 | 35 | 9 | 4 | 74 |

This research also found that the SMEs in *Trade, Hotel and Restaurant* industry have the longest history of interactive website adoption longer compared to the SMEs from other industries. It is because the SMEs in this industry have had an interactive websites since four or five years ago, and some of them even longer, more than six years ago. Table 5-26 below presents the length of interactive website adoption by SMEs in various industries.

**Table 5-26:** The length of Interactive Website Adoption by SMEs in Various Industries

| Industry Type | Time | | | | Total |
|---|---|---|---|---|---|
| | 1 year or less | 2 or 3 years | 4 or 5 years | 6 years and more | |
| Agribusiness | 1 | 0 | 0 | 0 | 1 |
| Manufacture | 6 | 9 | 1 | 1 | 17 |
| Construction | 1 | 0 | 0 | 0 | 1 |
| Trade, hotel and restaurant | 13 | 22 | 7 | 2 | 44 |
| Finance, rent & service | 5 | 4 | 1 | 0 | 10 |
| others | 0 | 0 | 0 | 1 | 1 |
| Total | 26 | 35 | 9 | 4 | 74 |

*The number of IT Personnel*

The number of IT personnel hired by SMEs, identified as interactive website adopters, is varied. This research found that mostly these SMEs have employed at least one IT personnel and some of them even more, employing more than three IT personnel. However, it cannot be denied that there are still many SMEs that have not employed IT personnel at all. This mainly occurs with the micro businesses. Table 5-27 explains in detail the number of IT personnel employed by SMEs in this sample.

**Table 5-27**: The number of IT personnel

| Firm size | IT Personnel | | | | Total |
|---|---|---|---|---|---|
| | None | 1-2 people | 3-5 people | More than 5 people | |
| Micro | 10 | 15 | 2 | 0 | 27 |
| Small | 4 | 24 | 5 | 0 | 33 |
| Medium | 4 | 4 | 3 | 3 | 14 |
| Total | 18 | 43 | 10 | 3 | 74 |

*The Use of IT by Interactive Website Adopters*

Similar to previous adopters, in this category it is also found that the use of IT by interactive website adopters is mainly aimed at marketing activities. Then it is followed by purchasing and procurement activities; logistics and distribution activities; after sales activities; financial activities and operational and processing

activities. The summary of the IT use reported by SMEs are presented in Table 5-28 below.

**Table 5-28**: The Use of Interactive Website

| Activities | Number of SMEs |
|---|---|
| Logistics and Distribution activities | 20 |
| Financial activities | 12 |
| Purchasing and procurement activities | 24 |
| Operational and Processing activities | 12 |
| Marketing activities | 69 |
| After sales services activities | 18 |

#### *5.2.1.1.4 Profile of Transactive Website Adopter (E-Commerce Adopter)*

The transactive website, or it also called as e-commerce, is a website that allows business not only to do two way communication between their partner (suppliers or customers) but it also allows business to carry out financial transactions on line. There are 40 SMEs that are already at this level. The detail of the transactive adopters will be described in the following sub sections.

*Firm Size and Industry Types*

Among these 40 transactive website adopters, 19 of them are small businesses, 16 are micro businesses and five are medium businesses. Those are mostly from the *Trade, Hotel and Restaurant* industry. Then, it is followed by the SMEs from the *Finance, Rent and Services* industry and the *Manufacturing* industry. Only few of them are from *Agribusiness and Electronic, Gas and Water Supply* industries. The profile of them can be seen in Table 5-29 below.

**Table 5-29**: Firm Size and Industry types of Transactive Website Adopters

| | Industry Type | | | | | Total |
|---|---|---|---|---|---|---|
| | Agribusiness | Manufacture | Electronic, gas and water supply | Trade, hotel and restaurant | Finance, rent & service | |
| Micro | 0 | 3 | 0 | 9 | 4 | 16 |
| Small | 1 | 2 | 1 | 12 | 3 | 19 |
| Medium | 1 | 0 | 0 | 4 | 0 | 5 |
| Total | 2 | 5 | 1 | 25 | 7 | 40 |

*Length of Transactive Website Adoption*

The length of transactive website adoption can be seen in Table 5-30 below.

**Table 5-30:** Length of Transactive Website Adoption

| | Time | | | | Total |
|---|---|---|---|---|---|
| | 1 year or less | 2 or 3 years | 4 or 5 years | 6 years and more | |
| Micro | 4 | 10 | 1 | 1 | 16 |
| Small | 4 | 10 | 2 | 3 | 19 |
| Medium | 1 | 1 | 3 | 0 | 5 |
| Total | 9 | 21 | 6 | 4 | 40 |

The table shows that for the micro businesses, mostly they adopted an transactive website two or three years ago. Only two of micro businesses that have had a transactive website for more than four years. However, there are four micro businesses that have just adopted a transactive website for one year or less.

Similar to the micro businesses, mostly the small businesses also can seen as transactive website adopters since two or three years ago. Two of the small businesses are reported as transactive website adopters since four or five years ago, and three of the small businesses even more, which have been adopted it for more than six years.

Different to both the micro and small businesses, medium businesses are found to be transactive website adopters since four or five years ago. None of them are found to be transactive website adopter for longer than six years. Then, only two medium businesses have adopted the transactive website for less than three years.

Considering the length of transactive website adoption based on industry types, it is found that mostly the SMEs in all industries have adopted transactive website for less than three years. However, it is still seen that some of SMEs have adopted more than four years ago, especially the SMEs in the *Trade, Hotel and Restaurant* industries. For more detail, Table 5-31 below presents the length of transactive website adoption in SMEs across the various industries.

**Table 5-31**: Length of Transactive Website Adoption

| Industry Type | Time | | | | Total |
|---|---|---|---|---|---|
| | 1 year or less | 2 or 3 years | 4 or 5 years | 6 years and more | |
| Agribusiness | 0 | 0 | 1 | 1 | 2 |
| Manufacture | 2 | 2 | 0 | 1 | 5 |
| Electronic, gas and water supply | 0 | 1 | 0 | 0 | 1 |
| Trade, hotel and restaurant | 6 | 12 | 5 | 2 | 25 |
| Finance, rent & service | 1 | 6 | 0 | 0 | 7 |
| Total | 9 | 21 | 6 | 4 | 40 |

*The Number of IT Personnel*

The number of IT personnel in transactive website adopters varies. In micro businesses, it is found most of them have employed two to three IT specialists. It is also reported that only two SMEs have three to five IT personnel and two SMEs do not have any IT personnel. Similar results are also seen in small and medium businesses, which mostly already have employed one to three IT personnel. Only a few of them already have more than three IT personnel. The details of the number of IT personnel hired by the transactive website adopter are shown in Table 5-32 below.

**Table 5-32:** The number of IT Personnel Hired by Transactive Website Adopters

| Firm size | IT Personnel | | | | Total |
|---|---|---|---|---|---|
| | None | 1-2 people | 3-5 people | More than 5 people | |
| Micro | 2 | 12 | 2 | 0 | 16 |
| Small | 2 | 12 | 4 | 1 | 19 |
| Medium | 0 | 4 | 1 | 0 | 5 |
| Total | 4 | 28 | 7 | 1 | 40 |

*The Use of IT by Transactive Website Adopters*

Table 5-33 presents the use of IT in various activities by transactive website adopters.

**Table 5-33:** The Use of IT by Transactive Website adopters

| Activities | Number of SMEs | |
|---|---|---|
| | Use | Non Use |
| Logistic and Distribution activities | 9 | 31 |
| Financial activities | 16 | 24 |
| Purchasing and procurement activities | 18 | 22 |
| Operational and Processing activities | 12 | 28 |
| Marketing activities | 34 | 6 |
| After sales services activities | 15 | 25 |

The table above shows that the majority of SMEs (85% or 34 SMEs) that have adopted transactive website use it for marketing activities. Besides marketing activities, this research also found that the SMEs also use it in purchasing and procurement activities, which are 18 SMEs; financial activities, 16 SMEs; after sales services activities, 15 SMEs; and logistics and distribution activities, nine SMEs.

#### *5.2.1.1.5 Internal Integration Adopter*

Internal integration means that in the business process there is integration between traditional business processes and activities and e-business process and activities that streamline communication and information flows in the organization (McKay and Marshal, 2004). In this research, only two of the samples are already at this stage. Their profiles are presented in following sub sections.

*Firm Size and Industry Types*

The two SMEs mentioned above are one small business from the *Trade, Hotel and Restaurant* industry; and one medium business from the *Agribusiness* industry. Table 5-34 below shows these data.

**Table 5-34:** Firm Size and Industry Types

| Firm Size | Industry Type | | Total |
|---|---|---|---|
| | Agribusiness | Trade, hotel & restaurant | |
| Small | 0 | 1 | 1 |
| Medium | 1 | 0 | 1 |
| Total | 1 | 1 | 2 |

*Length of Internal Integration Adoption*

The medium business which come from the *Agribusiness* industry has adopted internal integration for more than six years, which is longer than the small business in the *Trade, Hotel and Restaurant* industry which has just adopted it for less than one year. Table 5-35 describes the length of internal integration by these two SMEs.

**Table 5-35**: The Length of Internal Integration Adoption

| Industry Type | Time | | Total |
|---|---|---|---|
| | 1 year or less | 6 year or more | |
| Small Business in Trade, hotel and restaurant | 1 | 0 | 1 |
| Medium Business in Agribusiness Industry | 0 | 1 | 1 |
| Total | 1 | 1 | 2 |

*The Number of IT Personnel*

This research also found that the number of IT personnel employed by small business in the *Trade, Hotel and Restaurant* are fewer than the IT personnel employed by medium business in the *Agribusiness* industry. Table 5-36 demonstrates the number of IT personnel hired by both SMEs.

**Table 5-36:** The number of IT Personnel

| | IT personnel | | Total |
|---|---|---|---|
| | 1-2 people | More than 5 people | |
| Small | 1 | 0 | 1 |
| Medium | 0 | 1 | 1 |
| Total | 1 | 1 | 2 |

*The Use of IT by Internal Integration Adopter*

The use of IT by both SME groups also varies. For the small business in the *Trade, Hotel and Restaurant* industry, they use IT in three activities, which are in logistics and distribution activities, the financial activities and marketing activities. For the medium business in the *Agribusiness* industry, on the other hand, they use IT just for marketing activities

#### *5.2.1.1.6 Summary of E-commerce Adopters Profiles*

As described previously, the total numbers of SMEs that already adopt the e-commerce, starting from the very basic level to the advance level, are 280 SMEs, which consists of 102 micro businesses, 129 small businesses and 49 medium businesses. The levels of e-commerce adoption of these businesses are presented in Table 5-37 below:

**Table 5-37**: The Level of E-commerce Adoption

| Current condition of EC adoption | Firm size | | | Total |
|---|---|---|---|---|
| | Micro | Small | Medium | |
| e-mail | 26 | 27 | 11 | 64 |
| static website | 33 | 49 | 18 | 100 |
| interactive website | 27 | 33 | 14 | 74 |
| transactive website | 16 | 19 | 5 | 40 |
| internal integration | 0 | 1 | 1 | 2 |
| Total | 102 | 129 | 49 | 280 |

In micro businesses, currently, there are 26 businesses at a very basic level of e-commerce adoption, which just have and use e-mail in their business activity, and none of them are at the advanced level, which is the internal integration stage. Most of micro businesses are static website adopters or interactive website adopters.

In small businesses, it is also found that the majority of them are static website adopters or interactive website adopters. In total there are 82 small businesses (63.6%) at these levels. 27 of them are at a basic level, 19 businesses are at transactive website level and just only one business is at an advanced level.

A similar pattern is also seen in medium businesses, where most of them are static website adopters or interactive website adopters. 11 medium businesses are at very basic level, five businesses are at transactive website level and only one business is at internal integration level.

In regard to the type of industry, a majority of SMEs are from the *Trade, Hotel and Restaurant* industry, and it is followed by the SMEs in the *Manufacturing*, and the *Finance, Rent and Service* industries. Only a small numbers of them are from the *Agribusiness, Electric, Gas and Water Supply*, *Transport and Communication* industries. Table 5-38 below presents the details of the profile of e-commerce adopters.

**Table 5-38**: The Profile of E-commerce Adopters

| | Industry Type | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | Agribusiness | Manufacture | Electronic, gas and water supply | Construction | Trade, hotel and restaurant | Transport & communication | Finance, rent & service | Others | |
| Micro | 3 | 19 | 0 | 0 | 57 | 0 | 23 | 0 | 102 |
| Small | 1 | 30 | 1 | 4 | 68 | 2 | 23 | 0 | 129 |
| Medium | 2 | 17 | 0 | 1 | 22 | 0 | 6 | 1 | 49 |
| Total | 6 | 66 | 1 | 5 | 147 | 2 | 52 | 3 | 280 |

In term of the length of e-commerce adoption, it is found that mostly the micro, small and medium businesses have adopted e-commerce for less than three years. That is reasonable, because at that time internet technology was booming in Indonesia. The summary of the length of e-commerce adoption by SMEs in Indonesia is demonstrated in Table 5.39 below. This table shows that 34 SMEs have adopted e-commerce for more than six years, 44 SMEs have adopted it for four to five years, 138 SMEs have adopted it for two or three years, and 64 SMEs have adopted it just for one year or less.

**Table 5-39**: The Length of E-commerce Adoption

| | Time | | | | Total |
|---|---|---|---|---|---|
| | 1 year or less | 2 or 3 years | 4 or 5 years | 6 years and more | |
| Micro | 32 | 54 | 9 | 7 | 102 |
| Small | 26 | 60 | 23 | 20 | 129 |
| Medium | 6 | 24 | 12 | 7 | 49 |
| Total | 64 | 138 | 44 | 34 | 280 |

Among the 280 SMEs who already adopted e-commerce, 78 SMEs do not employ an IT specialist. This condition is reasonable, because as commonly known one of SMEs limitations is a lack of resources (both financial and human resources), as a consequence they cannot afford to hire an IT specialist to handle information systems in their business. Moreover, mostly SMEs in developing countries, especially in Indonesia, the SMEs are owner-manager firms, so the owner/manager handle many, if not all, activities by themselves. However, 202 SMEs already have employees that are specifically intended for IT services. Some of them have employed one or two people, some of them have employed three to five people and few of them has more than five IT specialists. For more detail, Table 5-40 below presents the number of IT specialist in the sample.

**Table 5-40**: Number of IT employee had by SMEs in Indonesia

| | IT Personnel | | | | Total |
|---|---|---|---|---|---|
| | None | 1-2 people | 3-5 people | More than 5 people | |
| Micro | 36 | 57 | 8 | 1 | 102 |
| Small | 34 | 72 | 20 | 3 | 129 |
| Medium | 8 | 23 | 10 | 8 | 49 |
| Total | 78 | 152 | 38 | 12 | 280 |

This research also found that IT is mostly used by SMEs in marketing activities. Followed by the purchasing and procurement activities, after sales services activities, financial activities, logistic activities and operational activities. Table 5-41 reports the use of IT by SMEs in various business activities.The table shows that 82.1% of SMEs use IT in their marketing activities. Then, 30.6% of SMEs reported that they use it in purchasing and procurement activities, 23.6% of SMEs

use it in after sales services activities, 22.9% of SMEs use it in financial activities, 21.3% of SMEs use it in logistics and distribution activities and only 15.9% of SME use it in operational and processing activities.

**Table 5-41**: The Activity involved in E-commerce Use

| Activities | Number of SMEs | Percentage |
|---|---|---|
| Marketing activities | 247 | 82.1% |
| Purchasing and procurement activities | 92 | 30.6% |
| After sales services activities | 71 | 23.6% |
| Financial | 69 | 22.9% |
| Logistic and delivery | 64 | 21.3% |
| Operational | 48 | 15.9% |

#### *5.2.1.2 Non Adopter*

There are twenty one SMEs who participated in this study that have not connected yet with the internet and they also do not have an e-mail. Two of them are micro businesses from the *Manufacturing* and the *Trade, Hotel and Restaurant* industries. seventeen businesses are small businesses, which are two businesses from the *Agribusiness* industry, seven businesses from *Manufacturing* industry, seven businesses from *Trade, Hotel and Restaurant* industry, and two businesses from *Finance, Rent and Services* industry. Then, two businesses are medium businesses from the *Trade, Hotel and Restaurant* and the *Finance, Rent* and *Services* industries. Table 5-42 below describes the profiles of non e-commerce adopters in detail.

**Table 5-42**: The Profile of Non E-commerce Adopter

| | Industry Type | | | | Total |
|---|---|---|---|---|---|
| | Agribusiness | Manufacture | Trade, hotel and restaurant | Finance, rent & service | |
| Micro | 0 | 1 | 1 | 0 | 2 |
| Small | 1 | 7 | 7 | 2 | 17 |
| Medium | 0 | 0 | 1 | 1 | 2 |
| Total | 1 | 8 | 9 | 3 | 21 |

Among non e-commerce adopters, eight SMEs admitted that they are in this condition since more than four years ago. Nine of these SMEs report that this condition has been going on since two or three years ago, and only four SMEs report that this condition has been going on for one year or less.

However, even though they currently have not connected yet to the internet, 11 SMEs (or 57% of the SMEs) have an intention to adopt e-commerce, at least static website, in the next few years.

### 5.2.2 Interview Respondents Profile

In this research, 22 of the SME owners participated further in an interview process. Table 5.43 demonstrates the profile of interviews respondents.

**Table 5-43**: Respondents Profile

| No | Company code | gender | Product | Size | Adopter/Non adopter | Level | Time of adoption |
|---|---|---|---|---|---|---|---|
| 1 | I | F | Traditional crackers, clothes and souvenirs | Medium | Adopter | Static website | 4-5 years |
| 2 | II | M | Builders equipment | Medium | Non Adopter | - | - |
| 3 | III | F | Embroidered scarf | Micro | Non Adopter | - | - |
| 4 | IV | M | Handicraft | Small | Adopter | Interactive website | 1 |
| 5 | V | M | Handicraft | micro | Non Adopter | - | - |
| 6 | VI | F | Embroidered scarf and clothes | Micro | Adopter | Static website | 4 |
| 7 | VII | F | Embroidered scarf and clothes | Small | Adopter | Static website | 4 |
| 8 | VIII | F | Clothes | Small | Adopter | Interactive website | 6 |
| 9 | IX | M | Handicraft | Small | Adopter | Static website | 5 |
| 10 | X | M | Muslim prayer artifacts | Medium | Adopter | Interactive website | 4 |
| 11 | XI | M | Fibre products | Medium | Adopter | Static website | 2 |
| 12 | XII | M | Woven clothes | Small | Adopter | Interactive website | 3 |
| 13 | XIII | M | Wood handicraft | Medium | Adopter | Interactive website | 5 |
| 14 | XIV | M | Clothes | Small | Adopter | Static website | 5 |
| 15 | XV | M | Traditional crackers | Micro | Non Adopter | - | - |
| 16 | XVI | F | Tailor and designer | Small | Adopter | Static website | 2 |
| 17 | XVII | F | Mushrooms cracker | Micro | Non Adopter | - | - |
| 18 | XVIII | M | Graphic design | Micro | Adopter | Static website | 4 |
| 19 | XIX | M | Woven clothes | Small | Adopter | Interactive website | 5 |
| 20 | XX | M | Hat, Bag and sandal | Small | Adopter | Static website | 3 |
| 21 | XI | F | Sports clothes | Small | Non Adopter | - | - |
| 22 | XII | M | Household goods | Medium | Adopter | Static website | 5 |

It can be seen from the table above that 16 of the SMEs who participated in the interview process are e-commerce adopters. Among the 16 e-commerce adopters, ten of them are at the static website level and six of them are in interactive website level. None of them is in transactive website, internal integration or external integration level. From the table above, it can be seen that the SMEs who are in the e-commerce adopters groups have adopted the e-commerce technology for four years or more.

The table above also shows that six interview respondents are non-e-commerce adopters. However, five of them were e-commerce adopters several years ago. For example, the company, with code III, had a static website during 2009-2011, but this website has not been active since 2012. Then, a company (code XV) had a static website on 2009 just for five months, and it has not been active since October 2009. A similar condition is also found in companies XVII and XXI, where they had a website just for several months. Some of the reasons that cause this condition are mentioned by the respondents and are presented in the following Table 5-44.

**Table 5-44**: Reasons stop adopting the e-commerce technology

| Company code | Reasons |
|---|---|
| II | • Lack of IT resources |
| III | • Lack of response from customers |
| V | • Lack of resources, especially in IT personnel<br>• Lack of IT ability of the owners<br>• The owners has low intention in regard to the e-commerce application |
| XV | • Lack of resources, IT personnel and financial resources<br>• The concerns of the owner in regard to the production capacity constraint, so it is feared the company cannot meet online orders. |
| XVII | • Lack of resources, human resources and financial resources |
| XXI | • Lack of resources, human resources and financial resources |

## 5.3 THE INFLUENCING FACTORS OF E-COMMERCE ADOPTION BY SMES IN INDONESIA

This section is aimed to answering the second research question, which is to investigate the factors that influence SMEs in adopting e-commerce. As previously described, in this study in order to investigate those factors influencing SMEs in adopting of e-commerce (H1 to H12), multiple regression analysis was used. Multiple regression analysis is one of statistic tools used to test the relationship between the independent factors; in this case there are 12 influencing factors, and the dependent variable: e-commerce adoption.

Before multiple regression analysis is conducted, it is important to carry out several steps to ensure that all of the data set used in this research is clean, and the data is suitable for multiple regression analysis. These steps are: data screening, factor analysis, and checking the assumptions of the multiple regression analysis procedure. Each step will be described separately in detail in the following sub sections.

### 5.3.1 Data Screening

There are several tests conducted for data screening. These tests are aimed to check data error, response bias and missing data.

#### *5.3.1.1 Checking for Data Errors*

Before running a data set in an SPSS programme, it is necessary for the researcher to ensure the data is free from errors. The errors, that might be caused by mistyping of data or misclassification of data type, can be identified by checking minimum and maximum values and also the number of valid and missing cases. In this study, none of the scores of the data set fall outside the possible value range for each variable and so this dataset is free from such errors

#### *5.3.1.2 Missing Data*

Missing data refers to incomplete data which occurs when the respondents do not fillin the questionnaire completely. Missing data can be classified into two categories, which are random missing data and systematic pattern missing data

(Pallant, 2013). To avoid the 'missing data' in an online survey, usually the mandatory questions are marked as mandatory, so the respondent cannot leave these questions until it is filled completely. In addition, in this study the incomplete data were dropped. Therefore, it can be ensured that the missing data problem does not exist in this research.

### 5.3.2 Factor Analysis

Factor analysis is commonly known as a data reduction technique (Pallant, 2013). This technique is used "to reduce a large number of related variables to a more manageable number, prior to using them in other analysis such as multiple regression or multivariate analysis of variance" (Pallant, 2013: 188). There are two techniques that are often used in factor analysis, which are Principal Component Analysis (PCA) and Common Factor Analysis (CFA) (Hair, 2010). Both PCA and CFA are similar in several respects, so that the results of PCA and CFA are often similar (Pallant, 2013).

Even though PCA and CFA techniques are similar, however some authors distinguish their use based on the objective of analysis and the amount of prior knowledge (Pallant, 2013; Tabachnick and Fidell, 2013; Hair, 2010). Tabachnick and Fidell (2013: 640) note that: 'if you interested in a theoretical solution uncontaminated by unique and error variability...FA is your choice. If, on the other hand, you simply want an empirical summary of the data set, PCA is the better choice'. Similar to this, Hair (2010) also mentioned that CFA should be chosen by researcher if:

(1) The primary objective is to identify the latent dimensions or constructs represented in the original variables, and
(2) The researcher has little knowledge about the amount of specific and error variance and therefore wishes to eliminate this variance.

On the other hand, it is suggested that the researcher choose PCA if

(1) Data reduction is a primary concern, and
(2) Prior knowledge suggests that specific and error variance represent a relatively small proportion of the total variance
(Hair, 2010: 107)

As the focus of this analysis is an empirical summary of the data set, hence PCA has been chosen. To be able to do this analysis, two things should be checked to ensure the data used in this research is fit for the factor analysis. These things are sample size and the strength of the relationship among the variables (Pallant, 2013: 189).

In regard to sample size, different authors suggest a different minimum number for the sample size. For example, Nunnally (1978), suggested a '*10 to 1'* ratio, which means at least 10 cases for each item to be factor analysed. Then, Pallant (2013) would suggest that the minimum sample size for this analysis is 150. Tabachnick and Fidell (2013: 613), state that "it is comforting to have at least 300 cases for factor analysis". However, Tabachnick and Fidell (2013) still accept that 150 cases is sufficient for this type of analysis especially if the result shows a high loading factor (above 0.80). As the number of the data used in this research are 301, the data set has met the sample size criteria. Regarding to the strength of the interrelationship between variables, it is suggested by Tabachnick and Fidell (2013) that the coefficient of correlation matrix value of 0.30 or above is suitable for factor analysis. In this case, the cofficient of correlation matrix value of research variables are higher than 0.30.

Besides using the criteria given by several authors to determine whether the data set is suitable for factor analysis or not, the IBM SPSS package also produce two measures to check these requirements, which are Kaiser-Meyer-Olkin (KMO) and Barlett's Test of Sphericity (BTOS). Both measures are used to ensure the adequacy of sampling for factor analysis.

#### *5.3.2.1 Kaiser-Meyer-Olkin (KMO) and Barlett's Test of Sphericity (BTOS)*

As mentioned earlier, it is important to understand what are appropriate KMO and BTOS values before conducting factor analysis. The KMO and BTOS values are produced in the factor analysis procedure. In regard to KMO, according to Hutcheson and Sofroniou (1999), if the KMO value is below 0.50, it will be considered as 'unacceptable'; the values between 0.50 – 0.70 are considered as 'mediocre' ; values between 0.70 - 0.80 are 'good', values between 0.80 - 0.90

are ‘great’ and values above 0.90 are ‘superb’. BTOS value, on the other hand, reflects the existence of the inter-correlation between variables (Hair, 2010). To be considered as ‘appropriate’ for factor analysis, the BTOS value should be significant with p <0.05.

The following table presents the result of KMO and BTOS test of this study.

**Table 5-45**: KMO and Bartlett’s Test

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .897 |
| Bartlett’s Test of Sphericity | Approx. Chi-Square | 14336.931 |
| | Df | 1653 |
| | Sig. | .000 |

It is shown that the KMO value is 0.897, which is higher than 0.50. As recommended by Hutcheson and Sofroniou (1999) above, this value is considered as ‘great’. Then, BTOS value is significant at p<0.05. Therefore, the combination of these values implies that the data set has met the requirement for factor analysis.

#### *5.3.2.2 Communalities*

After ensuring that the data set used in this study has met the above requirements, the next procedure in factor analysis is to check communalities. Communality refers to “total amount of variance an original value shares with all other variables included in the analysis”(Hair, 2010: 92). The communality is used to ensure whether or not the variable meets the ‘acceptable level of explanation’ (Hair, 2010). According to Hair (2010), the acceptable level for multiple constructs is 0.50 and above. Table 5-46 below presents the communalities value that is produced by Principal Component Analysis (PCA).

From Table 5-46, it can be seen that the communalities values are ranging from the lowest, 0.545 (for cust_sup_pres_d) to the highest, 0.904 (for Cost_c). None of the items has communalities below 0.50. Hence, all of the items are still retained for further analysis.

**Table 5-46**: Communalities

| | Initial | Extraction |
|---|---|---|
| Tot_asset | 1.000 | .739 |
| Emp_num | 1.000 | .737 |
| Tot_sales | 1.000 | .771 |
| perceiv_ben_a | 1.000 | .646 |
| Perceiv_ben_b | 1.000 | .619 |
| Perceiv_ben_c | 1.000 | .674 |
| Perceiv_ben_d | 1.000 | .637 |
| Perceive_ben_e | 1.000 | .699 |
| Perceiv_ben_f | 1.000 | .718 |
| Perceiv_ben_g | 1.000 | .568 |
| Perceiv_ben_h | 1.000 | .741 |
| Perceiv_ben_i | 1.000 | .594 |
| Perceiv_ben_j | 1.000 | .743 |
| Comp_a | 1.000 | .724 |
| Comp_b | 1.000 | .832 |
| Comp_c | 1.000 | .790 |
| Comp_d | 1.000 | .773 |
| Comp_e | 1.000 | .781 |
| Comp_f | 1.000 | .571 |
| Comp_g | 1.000 | .722 |
| cost_a | 1.000 | .856 |
| Cost_b | 1.000 | .863 |
| Cost_c | 1.000 | .904 |
| Cost_d | 1.000 | .817 |
| Tech_read_a | 1.000 | .712 |
| Tech_read_b | 1.000 | .775 |
| Tech_read_c | 1.000 | .759 |
| Tech_read_d | 1.000 | .661 |
| Tech_read_e | 1.000 | .757 |
| Tech_read_f | 1.000 | .739 |
| Cus_sup_pres_a | 1.000 | .807 |
| Cus_sup_pres_b | 1.000 | .854 |
| Cus_sup_pres_c | 1.000 | .760 |
| Cus_sup_pres_d | 1.000 | .545 |
| compet_pres_a | 1.000 | .804 |
| Compet_pres_b | 1.000 | .808 |
| Compet_pres_c | 1.000 | .857 |
| gov_pres_a | 1.000 | .773 |
| Gov_pres_b | 1.000 | .822 |
| Ven_sup_a | 1.000 | .883 |
| Ven_sup_b | 1.000 | .901 |
| Ven_sup_c | 1.000 | .876 |
| Innovativeness_a | 1.000 | .691 |
| Innovativeness_b | 1.000 | .706 |
| Innovativeness_c | 1.000 | .688 |
| Innovativeness_d | 1.000 | .706 |
| Involvement_a | 1.000 | .794 |
| Involvement_b | 1.000 | .789 |
| involvement_c | 1.000 | .785 |
| IT_know_a | 1.000 | .673 |
| IT_know_b | 1.000 | .770 |
| IT_know_c | 1.000 | .755 |
| IT_know_d | 1.000 | .684 |
| IT_know_e | 1.000 | .640 |
| IT_underst_a | 1.000 | .848 |
| IT_underst_b | 1.000 | .887 |
| IT_underst_c | 1.000 | .776 |
| IT_underst_d | 1.000 | .859 |

Extraction Method: Principal Component Analysis.

#### *5.3.2.3 Eigenvalues and Variances Percentage*

In order to decide how many components would be retained to further analysis, eigenvalues can be used. Eigenvalues represents the amount of variance accounted for by a factor (Hair, 2010: 92). It is suggested by Hair (2010) that only eigenvalues greater than 1 should be retained for further analysis. The eigenvalues resulted in this research are presented in Table 5-47 below.

**Table 5-47**: Total Variance Explained

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings |
|---|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total |
| 1 | 16.411 | 28.295 | 28.295 | 16.411 | 28.295 | 28.295 | 6.525 |
| 2 | 4.619 | 7.964 | 36.259 | 4.619 | 7.964 | 36.259 | 5.872 |
| 3 | 4.277 | 7.374 | 43.632 | 4.277 | 7.374 | 43.632 | 8.413 |
| 4 | 2.878 | 4.963 | 48.595 | 2.878 | 4.963 | 48.595 | 6.244 |
| 5 | 2.435 | 4.199 | 52.794 | 2.435 | 4.199 | 52.794 | 4.308 |
| 6 | 2.344 | 4.041 | 56.835 | 2.344 | 4.041 | 56.835 | 2.523 |
| 7 | 2.027 | 3.494 | 60.329 | 2.027 | 3.494 | 60.329 | 6.695 |
| 8 | 2.005 | 3.456 | 63.785 | 2.005 | 3.456 | 63.785 | 7.855 |
| 9 | 1.696 | 2.923 | 66.709 | 1.696 | 2.923 | 66.709 | 7.005 |
| 10 | 1.524 | 2.627 | 69.336 | 1.524 | 2.627 | 69.336 | 3.730 |
| 11 | 1.318 | 2.273 | 71.609 | 1.318 | 2.273 | 71.609 | 6.498 |
| 12 | 1.085 | 1.871 | 73.480 | 1.085 | 1.871 | 73.480 | 2.859 |
| 13 | 1.045 | 1.802 | 75.281 | 1.045 | 1.802 | 75.281 | 7.297 |
| 14 | .952 | 1.641 | 76.922 | | | | |
| 15 | .929 | 1.601 | 78.523 | | | | |
| 16 | .709 | 1.222 | 79.745 | | | | |
| 17 | .678 | 1.169 | 80.914 | | | | |
| 18 | .617 | 1.065 | 81.978 | | | | |
| 19 | .580 | .999 | 82.978 | | | | |
| 20 | .577 | .995 | 83.973 | | | | |
| 21 | .551 | .951 | 84.924 | | | | |
| 22 | .530 | .913 | 85.837 | | | | |
| 23 | .511 | .881 | 86.718 | | | | |
| 24 | .456 | .785 | 87.503 | | | | |
| 25 | .440 | .758 | 88.261 | | | | |
| 26 | .406 | .700 | 88.961 | | | | |
| 27 | .399 | .688 | 89.649 | | | | |
| 28 | .358 | .618 | 90.267 | | | | |
| 29 | .352 | .607 | 90.874 | | | | |
| 30 | .331 | .570 | 91.444 | | | | |

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings |
|---|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total |
| 31 | .324 | .559 | 92.003 | | | | |
| 32 | .306 | .528 | 92.531 | | | | |
| 33 | .283 | .488 | 93.019 | | | | |
| 34 | .272 | .468 | 93.487 | | | | |
| 35 | .263 | .453 | 93.940 | | | | |
| 36 | .259 | .446 | 94.386 | | | | |
| 37 | .247 | .425 | 94.811 | | | | |
| 38 | .238 | .410 | 95.221 | | | | |
| 39 | .220 | .379 | 95.601 | | | | |
| 40 | .208 | .359 | 95.959 | | | | |
| 41 | .206 | .355 | 96.315 | | | | |
| 42 | .190 | .328 | 96.643 | | | | |
| 43 | .189 | .326 | 96.969 | | | | |
| 44 | .184 | .317 | 97.286 | | | | |
| 45 | .167 | .288 | 97.575 | | | | |
| 46 | .160 | .276 | 97.851 | | | | |
| 47 | .152 | .262 | 98.113 | | | | |
| 48 | .143 | .247 | 98.360 | | | | |
| 49 | .137 | .237 | 98.597 | | | | |
| 50 | .122 | .211 | 98.808 | | | | |
| 51 | .115 | .198 | 99.007 | | | | |
| 52 | .112 | .193 | 99.199 | | | | |
| 53 | .104 | .180 | 99.379 | | | | |
| 54 | .093 | .160 | 99.539 | | | | |
| 55 | .088 | .151 | 99.690 | | | | |
| 56 | .079 | .136 | 99.826 | | | | |
| 57 | .064 | .111 | 99.936 | | | | |
| 58 | .037 | .064 | 100.000 | | | | |

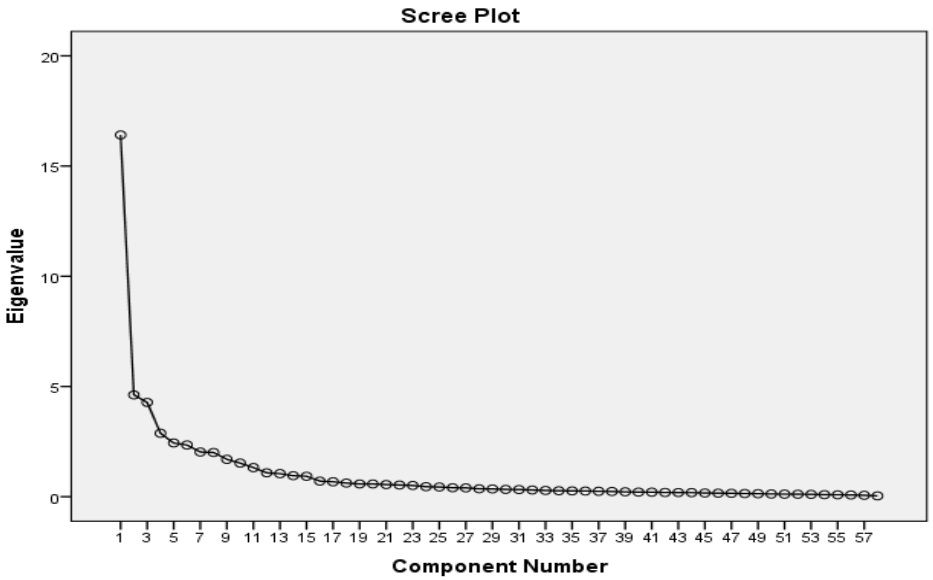
The table shows that there are thirteen factors with eigenvalues greater than 1. The lowest is 1.045 that explains 1.80% variance, and the greatest is 16.411, which explain 28.29% variance.

#### *5.3.2.4 Scree Plot*

Besides eigenvalues, a Scree Plot can also be used to determine the number of factors that should be retained in the analysis. According to Hair (2010: 110), the

Scree test is aimed "to identify the optimum number of factors that can be extracted before the amount of unique variance begins to dominate the common variance structure". Hair (2010) revealed that the elbow point in which the curve line become horizontal is considered as the maximum numbers of factors to be extracted. The scree plot of this research is presented in Figure 5-1 below:

Figure 5-1: **Scree Plot**




The figure above shows that the line is going down intensely from factor one to factor two, then it is going down more slowly from factors two to factor three and more sharply from factor three to factor four, and then it is getting steady at factor eleven. This means that the scree plot test above suggest to retain just eleven components to further investigation. However, in order to confirm this result, it is suggested by Pallant (2013) to do a Parallel Analysis. This analysis was conducted by running MonteCarloPA.exe. The random eigenvalue from the parallel analysis will be compared to the initial eigenvalue from the factor analysis. The component will be retained if the initial eigenvalue is greater than the random eigenvalue (see on Table 5-48 below).

Table 5-48 shows that ten components are suggested by the parallel analysis to be retained in further analysis, on the other hand the scree plot result suggested

retaining eleven components. To decide the number of components that should be retained, the personal judgement of researcher can be used. In this case, it was decided to retain the eleven components.

**Table 5-48**: Comparison of Eigenvalue from PCA and Parallel Analysis

| Component Number | Eigenvalue from parallel analysis | Eigenvalue from PCA | Decision |
|---|---|---|---|
| 1 | 1.9884 | 16.411 | Accept |
| 2 | 1.8957 | 4.619 | Accept |
| 3 | 1.8238 | 4.277 | Accept |
| 4 | 1.7671 | 2.878 | Accept |
| 5 | 1.7131 | 2.435 | Accept |
| 6 | 1.6665 | 2.344 | Accept |
| 7 | 1.6206 | 2.027 | Accept |
| 8 | 1.5747 | 2.005 | Accept |
| 9 | 1.5357 | 1.696 | Accept |
| 10 | 1.4972 | 1.524 | Accept |
| 11 | 1.4603 | 1.318 | Reject |
| 12 | 1.4205 | 1.085 | Reject |
| 13 | 1.3894 | 1.045 | Reject |

Once the number of components to be retained in this study was determined, the next procedure was to run another factor analysis with eleven component solution. Table 5-49 below present the KMO and Barlett's Test with eleven components retained.

**Table 5-49**: KMO and Bartlett's Test

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .871 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 11057.799 |
| | df | 1225 |
| | Sig. | .000 |

The Table 5-49 above shows that both KMO value and Bartlett's test value still meet the requirement for factor analysis.

Eigenvalue values and the total variance explained is presented in Table 5-50 below. The table shows that among eleven components retained, the highest eigenvalue is 12.197 which explained 24.40% variance and the lowest is 1.312 which explained 2.62% variance.

**Table 5-50**: Total Variance Explained

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings[a] |
|---|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total |
| 1 | 12.197 | 24.395 | 24.395 | 12.197 | 24.395 | 24.395 | 7.216 |
| 2 | 4.595 | 9.189 | 33.584 | 4.595 | 9.189 | 33.584 | 4.531 |
| 3 | 4.100 | 8.201 | 41.785 | 4.100 | 8.201 | 41.785 | 7.883 |
| 4 | 2.753 | 5.507 | 47.291 | 2.753 | 5.507 | 47.291 | 5.129 |
| 5 | 2.384 | 4.768 | 52.059 | 2.384 | 4.768 | 52.059 | 3.773 |
| 6 | 2.331 | 4.661 | 56.721 | 2.331 | 4.661 | 56.721 | 2.425 |
| 7 | 1.991 | 3.982 | 60.702 | 1.991 | 3.982 | 60.702 | 3.237 |
| 8 | 1.709 | 3.417 | 64.120 | 1.709 | 3.417 | 64.120 | 4.916 |
| 9 | 1.665 | 3.330 | 67.449 | 1.665 | 3.330 | 67.449 | 5.639 |
| 10 | 1.468 | 2.935 | 70.384 | 1.468 | 2.935 | 70.384 | 5.172 |
| 11 | 1.312 | 2.624 | 73.009 | 1.312 | 2.624 | 73.009 | 3.683 |
| 12 | 1.054 | 2.109 | 75.118 | | | | |
| 13 | .954 | 1.909 | 77.026 | | | | |
| 14 | .727 | 1.453 | 78.480 | | | | |
| 15 | .669 | 1.338 | 79.818 | | | | |
| 16 | .615 | 1.230 | 81.047 | | | | |
| 17 | .566 | 1.133 | 82.180 | | | | |
| 18 | .561 | 1.121 | 83.301 | | | | |
| 19 | .544 | 1.088 | 84.390 | | | | |
| 20 | .527 | 1.054 | 85.443 | | | | |
| 21 | .508 | 1.017 | 86.460 | | | | |
| 22 | .461 | .922 | 87.382 | | | | |
| 23 | .439 | .877 | 88.260 | | | | |
| 24 | .394 | .789 | 89.049 | | | | |
| 25 | .367 | .734 | 89.782 | | | | |
| 26 | .357 | .714 | 90.496 | | | | |
| 27 | .332 | .663 | 91.159 | | | | |
| 28 | .328 | .656 | 91.815 | | | | |
| 29 | .310 | .620 | 92.435 | | | | |
| 30 | .298 | .596 | 93.031 | | | | |
| 31 | .272 | .544 | 93.574 | | | | |
| 32 | .265 | .529 | 94.104 | | | | |
| 33 | .247 | .494 | 94.598 | | | | |
| 34 | .240 | .481 | 95.079 | | | | |
| 35 | .233 | .466 | 95.545 | | | | |
| 36 | .228 | .457 | 96.002 | | | | |
| 37 | .198 | .396 | 96.397 | | | | |
| 38 | .192 | .385 | 96.782 | | | | |
| 39 | .183 | .366 | 97.148 | | | | |
| 40 | .182 | .365 | 97.512 | | | | |
| 41 | .168 | .337 | 97.849 | | | | |
| 42 | .161 | .322 | 98.171 | | | | |
| 43 | .149 | .298 | 98.469 | | | | |
| 44 | .141 | .283 | 98.752 | | | | |
| 45 | .135 | .269 | 99.022 | | | | |
| 46 | .123 | .247 | 99.268 | | | | |
| 47 | .114 | .228 | 99.496 | | | | |
| 48 | .096 | .192 | 99.688 | | | | |
| 49 | .089 | .177 | 99.865 | | | | |
| 50 | .067 | .135 | 100.000 | | | | |

Extraction Method: Principal Component Analysis.

#### *5.3.2.5 Factor Loading Based on Rotated Component Matrix*

The next procedure was to rotate and interpret these eleven components. According to Tabachnick and Fidell (2013), there are two rotation techniques that can be used by researchers, which are orthogonal and oblique factor solutions. Both orthogonal and oblique are commonly used in many researches and they often generate similar result. However, both orthogonal and oblique have different requirement.

The former requires that the underlying constructs are independent (not correlated) (Tabachnick and Fidell, 2013: 192). On the other hand, the oblique allows correlation between the underlying constructs (Tabachnick and Fidell, 2013). Tabachnick and Fidell (2013) suggest using the oblique approach in order to check the level of inter-correlation between factors. Moreover, Hair (2010: 116) also reveals that the oblique approach is "best suited to the goal of obtaining several theoretically meaningful factors or constructs, because, realistically, few constructs in the real world are uncorrelated". Hence, in this research, the oblique approach, by using the Direct Oblimin technique, with eleven components to be extracts and suppressing small coefficients with absolute values below 0.50, was conducted.

The result of the oblique rotation, with is presented in Table 5-51below.

**Table 5-51:** Pattern matrix

| | Component | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Tech_read_c | .811 | | | | | | | | | | |
| Tech_read_b | .774 | | | | | | | | | | |
| Tech_read_a | .748 | | | | | | | | | | |
| Tech_read_d | .681 | | | | | | | | | | |
| Tech_read_e | .632 | | | | | | | | | | |
| Tech_read_f | .552 | | | | | | | | | | |
| Comp_f | | | | | | | | | | | |
| Ven_sup_a | | .866 | | | | | | | | | |
| Ven_sup_b | | .864 | | | | | | | | | |
| Ven_sup_c | | .847 | | | | | | | | | |
| Gov_pres_b | | .696 | | | | | | | | | |
| gov_pres_a | | .579 | | | | | | | | | |
| Percei_ben_j | | | .754 | | | | | | | | |
| | Component | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Percei_ben_c | | | .699 | | | | | | | | |
| Percei_ben_e | | | .686 | | | | | | | | |
| Percei_ben_i | | | .645 | | | | | | | | |
| Percei_ben_b | | | .645 | | | | | | | | |
| percei_ben_a | | | .644 | | | | | | | | |
| Percei_ben_d | | | .641 | | | | | | | | |
| Percei_ben_g | | | .635 | | | | | | | | |
| Percei_ben_f | | | .604 | | | | | | | | |
| Percei_ben_h | | | .571 | | | | | | | | |
| Comp_b | | | | | | | | | | | |
| Comp_c | | | | | | | | | | | |
| Comp_a | | | | | | | | | | | |
| Cost_c | | | | -.946 | | | | | | | |
| Cost_b | | | | -.939 | | | | | | | |
| cost_a | | | | -.922 | | | | | | | |
| Cost_d | | | | -.915 | | | | | | | |
| Tot_sales | | | | | .878 | | | | | | |
| Tot_asset | | | | | .878 | | | | | | |
| Emp_num | | | | | .826 | | | | | | |
| CS_pres_b | | | | | | -.879 | | | | | |
| CS_pres_a | | | | | | -.874 | | | | | |
| CS_pres_c | | | | | | -.792 | | | | | |
| CS_pres_d | | | | | | -.508 | | | | | |
| Inovtivess _c | | | | | | | -.797 | | | | |
| Inovtivess _b | | | | | | | -.756 | | | | |
| Inovtivess_d | | | | | | | -.729 | | | | |
| Inovtivess_a | | | | | | | -.673 | | | | |
| Involvent_a | | | | | | | | | | | |
| Involvent_b | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Comp_e | | | | | | | | -.864 | | | |
| Comp_g | | | | | | | | -.844 | | | |
| Comp_d | | | | | | | | -.830 | | | |
| IT_underst_b | | | | | | | | | .904 | | |
| IT_underst_a | | | | | | | | | .890 | | |
| IT_underst_d | | | | | | | | | .880 | | |
| IT_underst_c | | | | | | | | | .850 | | |
| IT_know_a | | | | | | | | | | .732 | |
| IT_know_d | | | | | | | | | | .658 | |
| IT_know_c | | | | | | | | | | .595 | |
| IT_know_e | | | | | | | | | | | |
| IT_know_b | | | | | | | | | | | |
| involvent_c | | | | | | | | | | | |
| Comt_pres_c | | | | | | | | | | | .808 |
| Comt_pres_b | | | | | | | | | | | .806 |
| comt_pres_a | | | | | | | | | | | .738 |

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 17 iterations.

As suggested by Hair (2010), the factor loading higher than ±0.50 is recognized as practically significant, hence all items that have factor loading below ±0.50 automatically are removed. In this case, nine items were removed.

After removing these items, the final results for new factor analysis are presented in Tables 5-52, 5-53 and 5-54 below.

**Table 5-52**: KMO and Bartlett's Test

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .868 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 10821.271 |
| | Df | 1176 |
| | Sig. | .000 |

**Table 5-53**: Total Variance Explained

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings[a] |
|---|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total |
| 1 | 11.831 | 24.145 | 24.145 | 11.831 | 24.145 | 24.145 | 7.058 |
| 2 | 4.595 | 9.377 | 33.522 | 4.595 | 9.377 | 33.522 | 4.555 |
| 3 | 4.099 | 8.366 | 41.888 | 4.099 | 8.366 | 41.888 | 7.745 |
| 4 | 2.655 | 5.418 | 47.306 | 2.655 | 5.418 | 47.306 | 4.926 |
| 5 | 2.384 | 4.865 | 52.171 | 2.384 | 4.865 | 52.171 | 3.761 |
| 6 | 2.328 | 4.752 | 56.923 | 2.328 | 4.752 | 56.923 | 2.426 |
| 7 | 1.991 | 4.063 | 60.986 | 1.991 | 4.063 | 60.986 | 3.234 |
| 8 | 1.694 | 3.458 | 64.443 | 1.694 | 3.458 | 64.443 | 4.724 |
| 9 | 1.651 | 3.370 | 67.813 | 1.651 | 3.370 | 67.813 | 5.627 |
| 10 | 1.444 | 2.946 | 70.759 | 1.444 | 2.946 | 70.759 | 5.069 |
| 11 | 1.273 | 2.598 | 73.357 | 1.273 | 2.598 | 73.357 | 2.931 |
| 12 | 1.053 | 2.149 | 75.507 | | | | |
| 13 | .952 | 1.942 | 77.449 | | | | |
| 14 | .726 | 1.482 | 78.931 | | | | |
| 15 | .664 | 1.355 | 80.286 | | | | |
| 16 | .613 | 1.250 | 81.536 | | | | |
| 17 | .562 | 1.147 | 82.683 | | | | |
| 18 | .549 | 1.121 | 83.803 | | | | |
| 19 | .541 | 1.105 | 84.908 | | | | |
| 20 | .508 | 1.038 | 85.946 | | | | |
| 21 | .464 | .946 | 86.892 | | | | |
| 22 | .456 | .930 | 87.823 | | | | |
| 23 | .403 | .823 | 88.646 | | | | |
| 24 | .376 | .767 | 89.413 | | | | |

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings[a] |
|---|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total |
| 25 | .359 | .732 | 90.145 | | | | |
| 26 | .343 | .699 | 90.845 | | | | |
| 27 | .332 | .677 | 91.521 | | | | |
| 28 | .316 | .644 | 92.165 | | | | |
| 29 | .303 | .619 | 92.785 | | | | |
| 30 | .283 | .577 | 93.362 | | | | |
| 31 | .269 | .550 | 93.912 | | | | |
| 32 | .256 | .522 | 94.434 | | | | |
| 33 | .242 | .494 | 94.928 | | | | |
| 34 | .240 | .489 | 95.418 | | | | |
| 35 | .229 | .467 | 95.885 | | | | |
| 36 | .198 | .404 | 96.288 | | | | |
| 37 | .193 | .395 | 96.683 | | | | |
| 38 | .187 | .382 | 97.065 | | | | |
| 39 | .183 | .373 | 97.438 | | | | |
| 40 | .170 | .348 | 97.786 | | | | |
| 41 | .162 | .330 | 98.116 | | | | |
| 42 | .155 | .317 | 98.434 | | | | |
| 43 | .141 | .289 | 98.722 | | | | |
| 44 | .135 | .275 | 98.997 | | | | |
| 45 | .123 | .252 | 99.249 | | | | |
| 46 | .115 | .234 | 99.483 | | | | |
| 47 | .097 | .197 | 99.680 | | | | |
| 48 | .089 | .181 | 99.861 | | | | |
| 49 | .068 | .139 | 100.000 | | | | |

Extraction Method: Principal Component Analysis.

**Table 5-54:** Pattern Matrix

| | Component | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| perceiv_ben_a | | | .740 | | | | | | | | |
| Perceiv_ben_b | | | .681 | | | | | | | | |
| Perceiv_ben_c | | | .736 | | | | | | | | |
| Perceiv_ben_d | | | .729 | | | | | | | | |
| Perceiv_ben_e | | | .746 | | | | | | | | |
| Perceiv_ben_f | | | .683 | | | | | | | | |
| Perceiv_ben_g | | | .738 | | | | | | | | |
| Perceiv_ben_h | | | .722 | | | | | | | | |
| Perceiv_ben_i | | | .694 | | | | | | | | |
| Perceiv_ben_j | | | .816 | | | | | | | | |

| | Component | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Comp_d | | | | | | | .866 | | | | |
| Comp_e | | | | | | | .875 | | | | |
| Comp_g | | | | | | | .837 | | | | |
| cost_a | | | | | | | | | .909 | | |
| Cost_b | | | | | | | | | .922 | | |
| Cost_c | | | | | | | | | .928 | | |
| Cost_d | | | | | | | | | .893 | | |
| Tech_read_a | .790 | | | | | | | | | | |
| Tech_read_b | .806 | | | | | | | | | | |
| Tech_read_c | .863 | | | | | | | | | | |
| Tech_read_d | .730 | | | | | | | | | | |
| Tech_read_e | .692 | | | | | | | | | | |
| Tech_read_f | .595 | | | | | | | | | | |
| Cus_sup_presa | | | | | .872 | | | | | | |
| Cus_sup_presb | | | | | .885 | | | | | | |
| Cus_sup_presc | | | | | .824 | | | | | | |
| Cus_sup_presd | | | | | .523 | | | | | | |
| compet_pres_a | | | | | | | | | | .793 | |
| compet_pres_b | | | | | | | | | | .851 | |
| Compet_presc | | | | | | | | | | .837 | |
| gov_pres_a | | .516 | | | | | | | | | |
| Gov_pres_b | | .636 | | | | | | | | | |
| Ven_sup_a | | .891 | | | | | | | | | |
| Ven_sup_b | | .925 | | | | | | | | | |
| Ven_sup_c | | .898 | | | | | | | | | |
| Innovativens_a | | | | | | | | -.713 | | | |
| Innovativens_b | | | | | | | | -.794 | | | |
| Innovativens_c | | | | | | | | -.814 | | | |
| Innovativens_d | | | | | | | | -.760 | | | |
| IT_know_a | | | | | | | | | | | .820 |
| IT_know_c | | | | | | | | | | | .595 |
| IT_know_d | | | | | | | | | | | .806 |
| IT_underst_a | | | | .915 | | | | | | | |
| IT_underst_b | | | | .937 | | | | | | | |
| IT_underst_c | | | | .840 | | | | | | | |
| IT_underst_d | | | | .916 | | | | | | | |
| Tot_asset | | | | | | .871 | | | | | |
| Emp_num | | | | | | .839 | | | | | |
| Tot_sales | | | | | | .862 | | | | | |

#### *5.3.2.6 Items Grouped*

Based on the tables above, the 49 items have been grouped into eleven components. The first component comprises ten items, which relate to *perceived benefits*. These items were initially intended to measure the perceived benefits, and these are supported by the factor analysis result.

The second component consists of three items which are related to *compatibility*. Initially, there were seven items that were used to measure it, however due to the factor analysis result four items were removed. Hence, in the further analysis the three items are used to measure *compatibility*.

The third, fourth, fifth and sixth components consist of (in order) four items, six items, four items and three item. All of the items were initially used to measure *cost, technology readiness, customers/suppliers pressure* and *competitor pressure.* Because each of the items are correlated based on factor analysis, so in the next procedure, they are still used to measure the same things.

The seventh component consists of five items. These five items was initially intended to measure two variables, which were *IT vendor support* and *government support*. However, because of the factor analysis result shows these five items are correlated; hence in next procedure these items are combined to measure one variable, which called as *external support*.

The eighth component consists of four items, which were initially used to measure *innovativeness*. As all of the items are correlated, these are still used to measure *innovativeness*.

The ninth and tenth components consist of four items and three items. All of these items were initially intended to measure the *owner/managers IT knowledge*, however because of these items were not correlated, these items are separated into two components. The former component related to IT ability, so it is called as *owner/managers IT ability*; while the latter is associated to IT experience, so it is called as *owner/managers IT experience*.

The last component, which consists of three items, relates with the firms size, so in further analysis, it is still recognized as *firm size*.

#### *5.3.2.7 Factors with Cronbach's Alpha, KMO, BTOS, Eigenvalue and Percentage of Variance*

Because the result of factor analysis affected variables that tested in this study, as well as the number of items that used to measure them, hence, it was necessary to check again the reliability of the new measures, Cronbach's Alpha,Kaiser-Meyer-Olkin (KMO), Barlett's Test of Sphericity (BTOS), Eigenvalue and percentage of variance for each factor. Table 5-55 below presents the summary of Cronbach's Alpha, KMO, BTOS, eigenvalue and percentage of variance for the new factors.

**Table 5-55:** Factors with Cronbach's Alpha, KMO, BTOS, Eigenvalue and Percentage of Variance

| Variable | N of Items | Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | KMO | BTOS | Eigenvalue | % of variance |
|---|---|---|---|---|---|---|---|
| Perceived benefit | 10 | 0.919 | 0.921 | .915 | .000 | 5.867 | 58.758 |
| Compatibility | 3 | 0.840 | 0.843 | .717 | .000 | 2.283 | 76.092 |
| Cost | 4 | 0.944 | 0.944 | .854 | .000 | 3.427 | 85.664 |
| Firm Size | 3 | 0.828 | 0.829 | .722 | .000 | 2.235 | 74.498 |
| Technology readiness | 6 | 0.910 | 0.911 | .860 | .000 | 4.152 | 69.197 |
| Customers/suppliers pressure | 4 | 0.856 | 0.857 | .773 | .000 | 2.817 | 70.433 |
| Competitor pressure | 3 | 0.911 | 0.912 | .756 | .000 | 2.553 | 85.099 |
| External support | 5 | 0.866 | 0.866 | .761 | .000 | 3.306 | 66.128 |
| Owner's innovativeness | 4 | .848 | .850 | .754 | .000 | 2.786 | 92.878 |
| Owner's IT ability | 4 | .933 | .933 | .854 | .000 | 3.334 | 83.350 |
| Owner's IT experience | 3 | .715 | .715 | .652 | .000 | 1.916 | 63.880 |

It is shown that the Cronbach's Alpha for all factors are above 0.60, which mean all of the factors meet the minimum requirement for internal validity, hence they can be used for further analysis. The table above also shows that the KMO and BTOS value for all factors are suitable for factor analysis (KMO should be greater than 0.50 and BTOS should be significant at less than 0.05). Moreover,

the eigenvalue for all factors is also greater than 1.0. The percentage of variance ranges from 58.76% to 92.88%.

#### *5.3.2.8 New Variables and the Hypotheses*

Eleven variables; perceived benefits, compatibility, cost, technology readiness, firm size, customers/suppliers pressure, competitor pressure, external support, owners/managers innovativeness, owners/managers IT ability and owners/managers IT experience, that suggested by factor analysis were further analyzed in this study. Changes in the number of variables tested in this study certainly affect the hypotheses proposed. The following are the new hypotheses of this study.

H1: Perceived benefits positively influence the adoption of e-commerce by the SME

H2: Compatibility positively influences the adoption of e-commerce by the SME

H3: Cost negatively influences the adoption of e-commerce by the SME

H4: Technology readiness positively influences the adoption of e-commerce by the SME

H5: Firm size positively influences the adoption of e-commerce by the SME

H6: Customer/supplier pressure positively influences the adoption of e-commerce by the SME

H7: Competitor pressure positively influences the adoption of e-commerce by the SME

H8: External support positively influences the adoption of e-commerce by the SME

H9: Owner/manager innovativeness positively influences the adoption of e-commerce by the SME

H10: Owner/manager IT ability positively influences the adoption of e-commerce by the SME

H11: Owner/manager IT experience positively influences the adoption of e-commerce by the SME

H12: The higher the level of e-commerce adoption by an SME, the more likely for that SMEs to gather the greater benefits of the e-commerce

H13: The adoption of e-commerce by an SME positively influence their performance

### 5.3.3 Multiple Regression Assumption

As described earlier, multiple regression analysis is used to investigate determinant factors of e-commerce adoption by SME in Indonesia. In this regard, to be able to do multiple regression analysis, it is important to check whether the data set used in this research has met the multiple regression analysis requirements or not. According to Tabachnick and Fidell (2013), there are five requirement needed to do this analysis, which are: an adequate of samples size; an absence of data outliers; an absence of multicollinearity and singularity; normality, linearity and homoscedasticity of the residual and independence of error (known as autocorrelation). These requirements are explained in detail in the following sub sections.

#### *5.3.3.1 Sample size*

The first requirement mentioned by Tabachnick and Fidell (2013) concerns an adequate sample size. Actually, there are no exact numbers considered as an "adequate". Different authors give different rules in regard to "an adequate" samples size criteria. For examples, Steven (2002) mentioned that at least 15 participants are needed for each predictor for research in social science. If a research has 13 predictors, so the minimum samples required are 195. On the other hand, Tabachnick and Fidell (2013) offer the rule that the minimum sample required for testing multiple correlation are 50+8m (m refers to the number of independent variables), while "104+m" samples are required for testing an

individual predictor. It means that if a research has 13 independent variables, the minimum samples required are 154 samples. Therefore, because of the samples of this research are 301 with thirteen predictors, it means the sample size criteria has been fulfilled.

#### *5.3.3.2 Data Outliers*

Data is considered as outliers if the scores of the data are very diverse compared with the scores of majority of data set. The multiple regression technique is very sensitive to such outliers. It is believed that the outliers will affect the regression result and it also affect the accuracy of regression estimation (Tabachnick and Fidell, 2013). Hence, it is important to ensure that the outliers do not exist in the data set used in this research. According to Hair (2010), there are three methods that can be used to detect the outliers, namely univariate detection, bivariate detection and multivariate detection. Because the number of variable tested are more than two, in this research, the univariate detection and multivariate detection were used to detect the outliers.

The univariate outliers can be detected by using a Z (standardized) score value. According to Hair (2010), for a small sample (80 or less) the outliers are identified as existing if the data set has a standard score of 2.5 and more; for a large sample (greater than 80 samples), on the other hand, the data set are usually defined as outliers if the standard score values is 4 or more. In this regard, Table 5-56 below presents Z score value of variables tested in this study.

**Table 5-56**: Z Score Values

| | N | Minimum | Maximum |
|---|---|---|---|
| Zscore: Firm size | 301 | -1.18240 | 1.68778 |
| Zscore: Technology readiness | 301 | -2.77883 | 1.95455 |
| Zscore: External support | 301 | -2.31302 | 2.21671 |
| Zscore: Perceived benefits | 301 | -4.99427 | 1.16670 |
| Zscore: Cost | 301 | -2.13895 | 1.74535 |
| Zscore: Customers suppliers pressure | 301 | -2.42636 | 2.22916 |
| Zscore: Innovativeness | 301 | -2.77515 | 1.55811 |
| Zscore: Compatbility | 301 | -2.60848 | 2.23316 |
| Zscore: IT ability | 301 | -2.20338 | 1.75761 |
| Zscore: IT experience | 301 | -3.91415 | 1.22317 |
| Zscore: Competitor pressure | 301 | -2.98292 | 1.31306 |
| Valid N (listwise) | 301 | | |

From the table, there are no factors that have z score more than 4. This means that this data set is free from univariate outliers.

Besides using the univariate detection, this research also used multivariate detection to detect the outliers. Multivariate detection was used because this research involves eleven variables, and this method is easier to use than bivariate detection. To detect the outliers on multivariate detection, the *Mahalanobis distance* value can be used (Pallant, 2013). By comparing the Mahalanobis distance value, produced in multiple regression procedure, with the critical chi-square value, whilst using the number of predictors as the degrees of freedom, the outliers can be identified. If the value of the Mahalanobis distance produced by regression analysis is greater than the critical chi-square value, it means outlier cases exist.

Because of the number of independent variables in this research are eleven, hence the critical chi-square value with 11 degrees of freedom on 0.001 of alpha level is 31.26. However, in this research the Mahalanobis distance value is ranging from .909 to 38.998, as presented in Table 5-57 below.

**Table 5-57**: Residual statistic

| | Minimum | Maximum | Mean | Std. Deviation | N |
|---|---|---|---|---|---|
| Predicted Value | 3.5448 | 13.1704 | 9.0033 | 1.62153 | 301 |
| Std. Predicted Value | -3.366 | 2.570 | .000 | 1.000 | 301 |
| Standard Error of Predicted Value | .163 | .746 | .375 | .110 | 301 |
| Adjusted Predicted Value | 3.1672 | 13.4126 | 9.0025 | 1.63153 | 301 |
| Residual | -6.46897 | 6.69950 | .00000 | 2.01013 | 301 |
| Std. Residual | -3.164 | 3.277 | .000 | .983 | 301 |
| Stud. Residual | -3.246 | 3.441 | .000 | 1.002 | 301 |
| Deleted Residual | -6.80856 | 7.38638 | .00081 | 2.08974 | 301 |
| Stud. Deleted Residual | -3.301 | 3.507 | .001 | 1.006 | 301 |
| Mahal. Distance | .909 | 38.998 | 9.967 | 6.763 | 301 |
| Cook's Distance | .000 | .110 | .004 | .008 | 301 |
| Centered Leverage Value | .003 | .130 | .033 | .023 | 301 |

The maximum value of Mahalanobis distance (38.998) of this research is greater than the critical chi square value (31.26), which means that the outliers were identified on the data set used in this research. As mentioned by Pallant (2013), in the real data set, it is usual to find several outliers, so this problem should not be feared by researcher. There are several alternatives, suggested by Tabachnick and Fidell (2013), that can be taken in order to solve the outliers problem; remove, change the score to less extreme value or transform the variable.

In this data set, there were 6 cases found as outliers, and as suggested by Pallant (2013), removing all of the outlier cases was chosen as the solution to this problem problem,. The Mahalanobis distance value after removing these cases was still slightly greater than the critical value. There were still three cases that had a Mahalanobis distance value greater than 34.53, hence these cases were also deleted. In total nine cases (six cases in first step and three cases in the next step) were removed in this step, and the final result of Mahalanobis distance value is presented in Table 5-58 below:

**Table 5-58**: Residual Statistic

| | Minimum | Maximum | Mean | Std. Deviation | N |
|---|---|---|---|---|---|
| Predicted Value | 3.0785 | 13.1978 | 8.9966 | 1.68400 | 292 |
| Std. Predicted Value | -3.514 | 2.495 | .000 | 1.000 | 292 |
| Standard Error of Predicted Value | .175 | .664 | .396 | .094 | 292 |
| Adjusted Predicted Value | 3.0046 | 13.4817 | 8.9998 | 1.68860 | 292 |
| Residual | -6.69706 | 5.97902 | .00000 | 1.96862 | 292 |
| Std. Residual | -3.337 | 2.979 | .000 | .981 | 292 |
| Stud. Residual | -3.427 | 3.023 | -.001 | 1.001 | 292 |
| Deleted Residual | -7.06502 | 6.15424 | -.00323 | 2.05186 | 292 |
| Stud. Deleted Residual | -3.495 | 3.068 | .000 | 1.005 | 292 |
| Mahal. Distance | 1.208 | 30.812 | 10.962 | 5.710 | 292 |
| Cook's Distance | .000 | .054 | .004 | .005 | 292 |
| Centered Leverage Value | .004 | .106 | .038 | .020 | 292 |

It can be seen that the maximum Mahalanobis distance value of this research is ranging from 1.208 to 30.812, in which the maximum value is below than the critical value of 31.26. Besides the Mahalanobis Distance value, Cook's Distance value can also be used to check the outliers (Pallant, 2013; Tabachnick and Fidell, 2013). According to Tabachnick and Fidell (2013), a Cook's Distance value greater than 1 potentially indicate a problem. In this research, the maximum value of Cook's Distance is .106, which means no major problem exists regarding to the outliers.

To sum up, in this step nine cases were removed; therefore the data set used for further analysis was 292 cases.

#### *5.3.3.3 Multicollinearity*

Multicollinearity refers to the interrelationship between independent variables. The multicollinearity problem exists if the correlation between independent variables is very high (r=0.9 and above) (Pallant (2013). Sekaran and Bougie (2013) state that the multicollinearity problem will affect the reliability of the estimation of the regression coefficient. Even for the extreme case (with r = 1 or -1), it makes the estimation impossible. Hence, if the multicollinearity is detected, it is suggested to choose one of the following procedures:

1. Reduce the set of independent variables to a set that are not collinear (but note that this may lead to omitted variable bias, which is also a serious problem)
2. Use more sophisticated ways to analyse the data, such as ridge regression
3. Create a new variable that is a composite of the highly correlated variables

Source: Sekaran and Bougie (2013: 319)

The simplest way to detect this problem is by using the Pearson Correlation Matrix. As mentioned earlier, the correlation value of 0.90 and above means the multicollinearity problem exist. In this research, based on the Pearson Correlation Matrix presented in Table 5-59 below, it can be seen that all of independent variables are free from multicollinearity problem.

**Table 5-59**: Pearson Correlation Matrix

| Model | FS | CP | C | ES | Innov | ITa | PB | Cs | CSP | ITe | TR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Firm size (FS) | 1.00 | .017 | -.127 | .046 | .044 | .044 | .080 | -.062 | -.007 | -.048 | -.019 |
| Competitor pressure (CP) | | 1.00 | -.014 | .039 | -.003 | -.08 | -.18 | -.087 | -.254 | -.181 | -.157 |
| Compatibility (C) | | | 1.00 | .007 | -.058 | -.07 | .066 | -.283 | -.003 | -.042 | -.012 |
| External Support (ES) | | | | 1.00 | .050 | .123 | .000 | .201 | -.324 | -.097 | -.308 |
| The Innovativeness (Innov) | | | | | 1.00 | .078 | .134 | .037 | .080 | .203 | .156 |
| IT ability (ITa) | | | | | | 1.00 | .025 | -.140 | -.004 | -.257 | -.186 |
| Perceived benefits (PB) | | | | | | | 1.00 | -.086 | -.084 | -.168 | -.095 |
| Cost (Cs) | | | | | | | | 1.00 | .012 | -.019 | -.224 |
| Customers suppliers pressure (CSP) | | | | | | | | | 1.00 | .032 | -.067 |
| IT experience (ITe) | | | | | | | | | | 1.00 | -.061 |
| Technology readiness (TR) | | | | | | | | | | | 1.00 |

The table shows that the lowest correlation is between External Support (ES) and Perceived Benefits (PB), which is 0.00; while the highest is between Competitor Pressure (CP) and Customers Suppliers Pressure (CSP), which is 0.254. These values imply that the data used in this research is free from multicollinearity problem.

Besides the Pearson Correlation Matrix, the Tolerance Value and the Variance Inflation Factor (VIF) can also be used to detect multicollinearity. The cut-off value suggested by several authors is above 0.10 for tolerance value and less than

10 for VIF (Pallant, 2013; Sekaran and Bougie, 2013). Table 5-60 below presents the Tolerance Value and VIF for this research.

**Table 5-60:** Collinearity Statistic

| Model | Collinearity Statistics | |
|---|---|---|
| | Tolerance | VIF |
| (Constant) | | |
| perceived benefits | .730 | 1.369 |
| technology readiness | .564 | 1.774 |
| compatibility | .848 | 1.179 |
| cost | .698 | 1.434 |
| customers suppliers pressure | .693 | 1.443 |
| IT ability | .701 | 1.426 |
| IT experience | .633 | 1.580 |
| competitor pressure | .644 | 1.553 |
| the Innovativeness | .731 | 1.368 |
| External support | .693 | 1.443 |
| Firm size | .958 | 1.044 |

None of independent variables have less than 0.10 for tolerance value. The minimum tolerance value of this research is 0.564, which is for Technology Readiness; and the maximum tolerance value is 0.958, for Firm Size. In addition, the VIF value for all variables is less than 10. The maximum VIF value is 1.774 (for Technology Readiness) and the minimum value is 1.044 (for Firm Size). These mean that the multicollinearity problem does not occur on the data set used in this study.

#### *5.3.3.4 Normality, Linearity and Homoscedasticity*

The fourth assumption of the multiple regression analysis concerns normality, linearity and homoscedasticity of the residual. These assumptions can be checked in several ways. One of these ways is by checking the residual scatterplots which can be obtained on the multiple regression procedure result (Pallant (2013). The residual, which refers to "the differences between the obtained and the predicted dependent variable (DV) scores"(Pallant (2013), scatterplot can be used to check:

- *Normality:* the residuals should be normally distributed about the predicted DV scores
- *Linearity:* the residuals should have a straight-line relationship with predicted DV scores

- *Homoscedasticity:* the variance of the residuals about predicted DV scores should be the same for all predicted scores

Source: Pallant (2013)

Regarding to the data used in this research, Figure 5.2 and Figure 5.3 below show a Normal Probability Plot (P-P) of the Regression Standardised Residual and the residual scatterplot.

**Figure 5-2**: Normal Probability Plot (P-P)

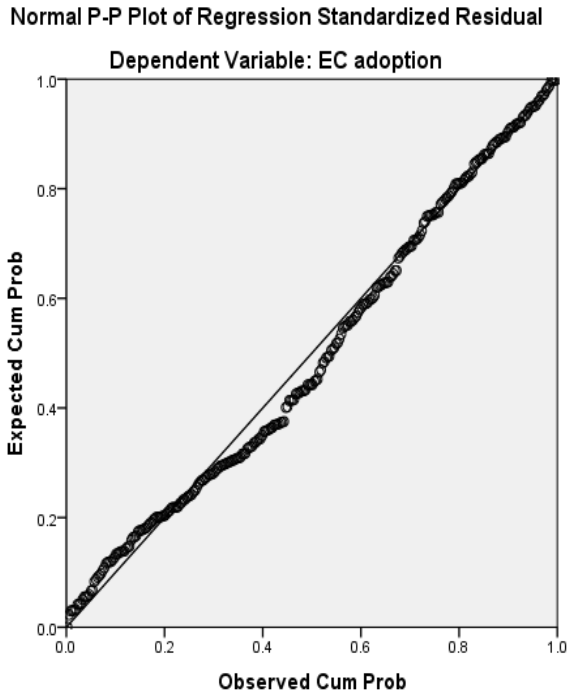
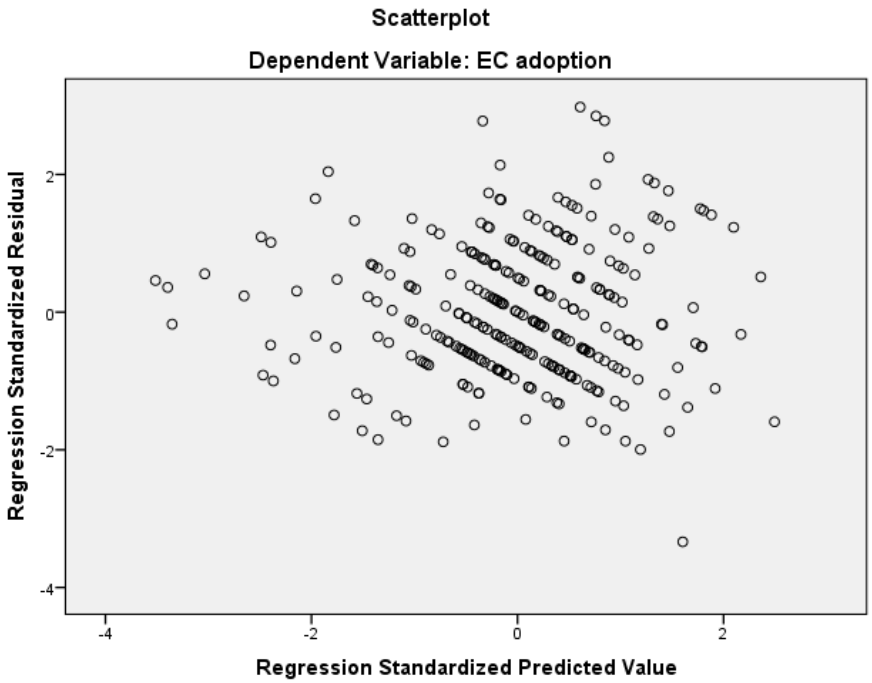


**Figure 5-3**: Scatterplot




According to Pallant (2013), in a Normal P-P plot figure, if the data, pictured by dots, createa fairly straight diagonal line from bottom left to top right, it means the data can be considered as normal and linear. While, in a Scatterplot figure**,** if the residual is dispersed in rectangle shape and mostly concentrated along on the middle (zero point), it means that the variance scores are much the same. Based on both figures above, it can be seen that, both Normal P-P plot and Scatterplot show the condition as mentioned by Pallant (2013). It means that the normality, linearity and homoscedasticity of residuals assumptions are met.

#### *5.3.3.5 Independence of Errors*

The fifth assumption is about the independence of errors (known as autocorrelation), which is that the errors of prediction must be independent of each other (Tabachnick and Fidell, 2013). To test this assumption, a Durbin-Watson (DW) test can be used. If the DW value that results from multiple regression is greater than the DW value in table, it means the autocorrelation problem does not exist and vice versa (Pallant, 2013). In this research, the DW

value produced by multiple regression procedure, which is 2.118, is greater than the DW value in table, which is 1.80 (with 11 independent variables and more than 200 cases). It implies that there is no autocorrelation problem found in this data set.

To sum up, the data set used in this research met the requirement for the multiple regression analysis.

### 5.3.4 Descriptive statistics

After removing data outliers, the total remaining data set in this research was 292 cases. Based on these cases, the table below summarizes the descriptive statistic of each variable.

**Table 5-61**: Descriptive Statistics

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| The external support | 292 | 5.00 | 25.00 | 14.8048 | 4.38204 |
| The Innovativeness | 292 | 4.00 | 16.00 | 8.5856 | 2.87952 |
| IT experience | 292 | 3.00 | 15.00 | 12.2089 | 2.21697 |
| Competitor pressure | 292 | 3.00 | 15.00 | 11.3801 | 2.72749 |
| IT ability | 292 | 4.00 | 20.00 | 12.9486 | 3.94299 |
| Compatibility | 292 | 3.00 | 15.00 | 9.4795 | 2.39621 |
| Customers suppliers pressure | 292 | 4.00 | 20.00 | 12.3836 | 3.36703 |
| Cost | 292 | 4.00 | 20.00 | 12.7740 | 4.04064 |
| Perceived benefits | 292 | 20.00 | 50.00 | 43.3938 | 4.88131 |
| Technology readiness | 292 | 6.00 | 30.00 | 20.1575 | 4.92583 |
| Firm size | 292 | 1 | 3 | 1.82 | .690 |
| Valid N (listwise) | 292 | | | | |

The numbers of questions asked for each of the variables: the external support; the innovativeness; IT experience; competitor pressure; IT ability; compatibility; customers suppliers pressure; cost; perceived benefits; technology readiness and firm size respectively are 5, 4, 3, 3, 4, 3, 4, 4,10, 6 and 3. Respondents could answers on a range from 1 to 5 (strongly agree to strongly disagree). Based on the table above and the number of question measured for each variable, it can be calculated that, on average, the scores given by respondent for each variables are 2.961 for the vendor and government support, 2.146 for the innovativeness, 4.070

for IT experience, 3.793 for competitor pressure, 3.237 for IT ability, 3.160 for compatibility, 3.096 for customers suppliers pressure, 3.19 for cost, 4.33 for perceived benefits, 3.359 for technology readiness, and 1.8 for firm size.

### 5.3.5 Multiple Regression Analysis

After ensuring that all of the data sets used in this research are suitable for multiple regression, the next step was to conduct the multiple regression analysis. Multiple regression analysis is a statistical tool used to test the relationship between independent variables with a dependent variable (Hair, 2010). This relationship can be simply explained in following equation:

$$Y= a + b_1x_1+b_2x_2+b_3x_3+....+b_nx_n + e$$

Where Y is dependent variable

a is intercept

b is regression coefficient

x is independent variables

e is an error term

In this research, there are 11 independent variables. These variables are grouped into four main factors, namely *technological factors* which contain perceived benefit, compatibility and, cost; *organizational factors* which consist of firm size and technology readiness; *environmental factors* which are customers/suppliers pressure, competitor pressure, external support; and *individual factors* which contain owners' innovativeness, owners' IT ability and owners' IT experience. The dependent variable in this research is e-commerce adoption, which is measured by two indicators: level of e-commerce adoption, by asking respondents about the current condition of e-commerce adoption; and the extent of e-commerce use in SME, by asking about the activity involved in e-commerce use in SME. This measure was also used by Teo and Pian (2004), Ghobakhloo, Arias-Aranda, and Benitez-Amado (2011), Ghobakhloo and Tang (2013), Ghobakhloo et al. (2011) and Sila (2013). The result of the multiple regression procedure is explained in detail in the following sub section.

#### *5.3.5.1 Model Summary Table*

A Model Summary table is one of the tables produced by the multiple regression procedure. This table contains some important information; *R*, *R square, Adjusted R square* and *Standar error of the estimate*. Table 5-62 below presents the Model Summary table for the multiple regression procedure.

**Table 5-62**: Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .650 | .423 | .400 | 2.00692 |

R value is the absolute value of the Pearson correlation between the dependent variable and independent variable (Kinnear and Gray, 2010). In this study the R value is 0.650. The R square value provides information about "how much of the variance in dependent variable is explained by the model" (Pallant, 2013: 161). The R square value, known as the multiple correlation coefficient or coefficient of determination ranges from 0 to 1. The closer the value of R square to 1 implies the greater portion of dependent variable variances are explained by the model. In the table above shows that the R square value of this research is 0.423. It means in this research, 42.3% of variances on e-commerce adoption are explained by the independent variable collectively. However, according to Pallant (2013), the R square value has limitation especially if the small sample involved, "the R square value in sample tends to be a rather optimistic overestimation of the true value in the population" (Pallant, 2013). This is because every independent variable added to the model will increase the R value certainly even though the variables added may not have a practical impact.

Hence, several authors (see for example: Pallant, 2013; Tabachnick and Fidell, 2013) suggested the use of Adjusted R square rather than simply R square (especially with a small sample) in assessing the ability of model to explain the variance of dependent variables. It is believed that the Adjusted R square provides a better estimation (Pallant, 2013). In regard to this, the table above shows that

the Adjusted Rsquare of this research is 0.40. It means the model of this research explains 40% of the variance of e-commerce adoption.

#### *5.3.5.2 ANOVA table*

Another output of the multiple regression procedure is the ANOVA table. Table 5-63 below presents the ANOVA table.

**Table 5-63**: ANOVA

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Regression | 825.232 | 11 | 75.021 | 18.626 | .000 |
| Residual | 1127.764 | 280 | 4.028 | | |
| Total | 1952.997 | 291 | | | |

The table above presents the F test result. The F test is aimed to ensure whether independent variables involved in the model collectively have significance correlation to the dependent variable or not. The F test also reflects the statistical significance of the whole model (Bryman, 2005). Thus, the F test is used to determine a model fit of the multiple regression model, which is related to its ability to predict the outcome variable. To determine whether the model is a good fit, the value of F changes and the significance value of F changes can be used.

By comparing the value of F changes provided by the regression procedure with the value of F table, the model fit can be identified. If the value of F change is higher than the F table, it means that the model is a fit, in which the independent variables have a significance correlation to the dependent variables, and vice versa. Then, if the significance value of F changes is below 0.05, it also means that the independent variables are significantly correlated with the dependent variable.

In this case, based on the table above it can be seen that the value of F changes produced by multiple regerssion procedure (which is 18.63) is greater than the value of F table (which is 1.850), and this is also supported by the significance value that less than 0.05, which is 0.000. Hence, it can be concluded that this

model is a fit where the independent variables included in this model collectively have a significance correlation to the dependent variable.

#### *5.3.5.3 The Relationship between Independent Variables with Dependent Variables*

In order to know the contribution of each variable involved in this model to predict the dependent variable, a Coefficient table (presented in Table 5-64 below) can be used.

**Table 5-64**: Coefficient

| Variable | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | Beta | Std. Error | Beta | | |
| (Constant) | -4.059 | 1.542 | | -2.631 | .009 |
| Perceived Benefits (PB) | .106 | .028 | .200 | 3.759 | .000 |
| Compatibility (CP) | .015 | .053 | .014 | .288 | .774 |
| Cost (Cs) | .006 | .035 | .009 | .168 | .866 |
| Technology Readiness (TR) | .169 | .032 | .321 | 5.315 | .000 |
| Firm Size (FS) | .019 | .174 | .005 | .106 | .915 |
| Customers Suppliers Pressure (CSP) | .014 | .042 | .019 | .343 | .732 |
| Competitor Pressure (CP) | -.018 | -.054 | -.019 | -.339 | .735 |
| External Support(ES) | .067 | .032 | .113 | 2.066 | .040 |
| IT ability (ITa) | .205 | .036 | .312 | 5.761 | .000 |
| IT experience (ITe) | .193 | .067 | .165 | 2.897 | .004 |
| Innovativeness (Innov) | .129 | .048 | .143 | 2.700 | .007 |

The table above shows that there are two types of coefficients, which are unstandardised coefficients and standardised coefficients. To compare the contribution of each independent variables in the predicting of the dependent variable, the standardised coefficients are used. However, to generate the multiple regression equation, the unstandardised coefficients are used (Pallant, 2013).

Based on the table above, it can be seen that the Technology Readiness (TR) has the largest standardized coefficients value, which is 0.321, which means that the TR makes the strongest contribution to explaining the e-commerce adoption (EC),

when the variance explained by all other independent variables in this model have been controlled. The second largest is the IT ability (ITa) with the coefficient value of 0.312, then followed by the Perceived Benefits (PB), which is 0.200; IT experience (ITe), 0.165; Innovativeness (Innov), 0.143; and External support (ES), 0.113. The table also shows that the smallest contribution in explaining the e-commerce adoption is the Firm Size (FS), which is 0.005.

The result above can also be transformed into the equation below:

Y = -4.059 +0.106PB + 0.015CP + 0.006Cs + 0.169TR + 0.19FS + 0.014CSP – 0.018CP + 0.067ES + 0.205ITa + 0.193ITe + 0.129Innov

The positive or negative sign in the equation above reflects the direction of correlation between variables. If the sign is positive, it means the increase of independent variable scores can affect the increase of dependent variable scores and vice versa. The negative sign, in contrast, means that the decrease of independent variable scores has an impact on the increase of dependent variable scores and vice versa. Then, the value of regression coefficients reflects the value of the decreasing or increasing of variables.

*Technological Factors*

Technological factors relate to technology aspects that influence the adoption of e-commerce technology. In this research, perceived benefits, compatibility and cost are categorized as technological factors. The result of multiple regressions above shows that the coefficient of regression for perceived benefit is positive 0.106, which means for every unit increase in perceived benefits, it is expected that there would be an 0.106 unit increase in e-commerce adoption, holding all other variables constant.

The coefficient of regression for compatibility is also positive, which a value of 0.015. It implies that every unit increase in compatibility, a 0.015 unit increase is expected in e-commerce adoption, holding all other variables constant. As well as the previous two variables, the coefficient of regression for cost is also positive.

The value is 0.006 which means every unit increase in cost will affect an 0.006 increase in e-commerce adoption, holding all other variables constant.

Among the technological factors, cost has the lowest value of coefficient regression; and the perceived benefit has the highest value. However, the greater or the smaller regression coefficient value cannot be used to determine whether the coefficient has significant impact on dependent variable or not. To know this, the t value/significance value can be used. By using 95% level of confidence, if the significance value resulted by the regression model is below than 0.05, it means the coefficient is significant and vice versa.

Table 5.64 shows that the significance value for each technological factor; perceived benefits, compatibility and cost are 0.00, 0.774, and 0.866. It can be seen that only the perceived benefits has a significance value below 0.05; while the others are above 0.05. It means that only perceived benefit has a significant impact on e-commerce adoption. Therefore, in this study the hypothesis 1 (H1) is fully supported, while the others (H2 and H3) are not supported.

*Organizational Factors*

Organizational factors refer to the characteristics of business that might influence the adoption of innovation technology. Technology readiness and firm size are classified into this category. Table 5-64 above shows that the technology readiness has a positive 0.169 for its coefficient regression, which means every unit increase in technological readiness, it is expected that 0.169 unit increase in e-commerce adoption, holding all other variables constant. Then, the coefficient of regression for firm size is positive 0.019, which implies that for every unit increase in firm size, a 0.019 unit increase is expected in e-commerce adoption, holding all other variables constant.

The significance values for each variable are 0.00 for the technology readiness and 0.915 for firm size. It implies that in technological factors, only the technology readiness that has a positive and significant relationship with the e-commerce adoption. Therefore, in this case the hypothesis 4 (H4) is supported, while the hypothesis 5 (H5) is not supported.

*Environmental factors*

Environmental factors relate to the pressure or support from the external factors that influence the adoption of e-commerce. There are three variables included in this factor, which are the customers/suppliers pressure; the competitor pressure and the support from government and IT vendor.

The regression analysis result shows there are two variables that have a positive regression coefficient, and one variable that has negative regression coefficient. The positive 0.014 is shown on the customers/suppliers pressure, in which every unit increase in customer/supplier pressure, a 0.014 unit increase is expected in e-commerce adoption, holding all other variables constant. In the same way, the positive sign is also shown on the regression coefficient of the external support, which is positive 0.067. It implies that every unit increase in external support, a 0.067 unit increase is expected in e-commerce adoption, holding all other variables constant.

In contrast, the negative sign (-0.018) is shown on the regression coefficient of competitor pressure, which means that every unit increase in competitor pressure, a 0.018 unit decrease is expected in e-commerce adoption, holding all other variables constant.

In order to know whether the variables above have significant relationship with the e-commerce adoption or not, the significance value of each factor should be considered. Among these variables, only external support has significance below 0.05, which is 0.040. It means the external support has a positive and significant correlation with the e-commerce adoption. Hence, in this research the hypothesis 8 (H8) is fully supported, while the others (H6 and H7) are not supported.

*Individual Factors*

In addition to TOE (technological, organizational and environmental) factors, this research also examines the effect of individual context, such as manager or owner's innovativeness, manager or owner's IT experience and manager orowner's IT ability, in the adoption of e-commerce in SME.

The result from regression analysis shows that the coefficient of regression for manager or owner's innovativeness is positive 0.129, which means every unit increase in innovativeness will affect an 0.129 increase in e-commerce adoption. In line with this, the coefficient of regression for manager or owner's IT experience and IT ability arealso positive, which are 0.193 and 0.205. In this regard, every unit increase in manager/owner's IT experience and IT ability, the 0.193 and 0.205 unit increase are expected in e-commerce adoption, holding all variables constant.

The table also shows that the significance values for all of the individual factors are below 0.05 (which are 0.007 for the innovativeness, 0.004 for IT experience and 0.000 for IT ability). This means that all of variables in the individual factors have a positive and significant relationship with the e-commerce adoption. Therefore, in this research the hypotheses H9, H10 and H11 are fully supported

## 5.4 Interview Result

Twenty-two SMEs manager/owners's participated in the interview process, sixteen of them are e-commerce adopters, while six of them are non-e-commerce adopters. As described in Chapter Four, one of the questions asked to the interviewees is what factors influenced them in adopting the e-commerce technology. The interviewees were not asked to rank the factors; however in this process the number of times any given factors were mentioned are counted. The following table presents the interview result regarding to determinant factors of the e-commerce adoption.

**Table 5-65:** Determinant Factors of the E-commerce Adoption

| Determining Factors of EC adoption | Number of mentions | % |
|---|---|---|
| Perceived benefit | 14 | 87.5% |
| Compatibility | 0 | - |
| Cost(low cost) | 6 | 37.5% |
| Technology readiness | 1 | 6.25% |
| Firm size | 0 | - |
| Customer and supplier pressure | 3 | 18.75% |
| Competitor pressure | 1 | 6.25% |
| External support | 6 | 37.5% |

| | | |
|---|---|---|
| Innovativeness | 8 | 50% |
| IT experience | 3 | 18.75% |
| IT ability | 9 | 56.25% |

The table above shows that 14 interviewees from 16 interviewees reported that the perceived benefits as the determinant factor in adopting of the e-commerce technology. Then, nine of sixteen interviewees reported that pressure from competitor and IT ability as the determinant factor in adoption of the e-commerce technology. Others factors, such as cost, technology readiness, customer and supplier pressure, competitor pressure, external support, owner's innovativeness and IT experience, are also reported by some interviewees as the determinant factors of the e-commerce adoption.

## 5.5 E-COMMERCE BENEFITS

This section is intended to describe the research finding that related to the third research objective, which is to explore the benefits perceived by the Indonesian SMEs in regard to the adoption of e-commerce. Fifteen benefits identified from previous studies are proposed in this study as the potential benefits provided by the e-commerce technology. These are:

1. Increased revenue (benefit a)
2. Reduced operation cost (benefit b)
3. Reduced cost of purchasing and procurement (benefit c)
4. reduced marketing costs (benefit d)
5. increased customer loyalty and retention (benefit e)
6. Reduced complain from client (benefit f)
7. improved supplier relationship (benefit g)
8. improved competitive position (benefit h)
9. extending market reach (benefit i)
10. improved speed of processing (benefit j)
11. improved external communication (benefit k)
12. improved company image (benefit l)
13. improved internal communication (benefit m)

14. Increased employee's satisfaction (benefit n)
15. Increased employee's productivity (benefit o)

The benefits were measured by asking respondents about their perception regarding these benefits using a five point Likert-scale, ranging from 1 (strongly agree) to 5 (strongly disagree). However, for consistency of measurement, then in further analysis the score of respondent's perceptions was re-coded, in which score 1 for strongly disagree to 5 for strongly agree.

### 5.5.1 Descriptive analysis

Table 5-66 presents the response given by the Indonesian SMEs owners in regard to the e-commerce benefits perceived by them. From the table, it can be seen the top six benefits reported by the respondents are extending market reach, increased revenue, improved company image, improved external communication, improved employee's productivity and improved speed of processing.

**Table 5-66**: Responses on the Benefits of E-commerce

| | Strongly Agree and Agree | Neutral | Disagree and Strongly Disagree | Mean | Standard Deviation |
|---|---|---|---|---|---|
| Increased revenue | 240 | 21 | 2 | 4.37 | .662 |
| Reduced operation cost | 185 | 55 | 23 | 3.86 | .898 |
| Reduced cost of purchasing and procurement | 134 | 89 | 40 | 3.48 | .984 |
| Reduced marketing costs | 196 | 45 | 22 | 3.88 | .898 |
| Increased customer loyalty and retention | 170 | 78 | 14 | 3.78 | .808 |
| Reduced complain from client | 131 | 101 | 31 | 3.48 | .851 |
| Improved supplier relationship | 169 | 77 | 17 | 3.75 | .814 |
| Improved competitive position | 204 | 49 | 10 | 3.94 | .749 |
| Extending market reach | 256 | 6 | 0 | 4.49 | .545 |
| Improved speed of processing | 216 | 39 | 5 | 4.13 | .729 |
| Improved external | 231 | 27 | 4 | | |

| | | | | | |
|---|---|---|---|---|---|
| communication | | | | 4.16 | .676 |
| Improved company image | 237 | 24 | 1 | 4.29 | .642 |
| Improved internal communication | 213 | 54 | 5 | 4 | .727 |
| Increased employee's satisfaction | 169 | 88 | 6 | 3.83 | .780 |
| Increased employee's productivity | 218 | 39 | 6 | 4.09 | .736 |

### 5.5.2 The E-commerce Benefits and the Level of E-commerce Adoption

In order to identify the benefits realized by Indonesian SMEs in each level of e-commerce adoption, the mean scores for each benefit perceived by the SMEs in each level is counted. In this process, due to the limited numbers of participants in the *internal integration* group (only two participants), the participants of this group were merged into transactive website adopters. As a result, in this further analysis, the level of e-commerce adoption consists of four levels, which are e-mail, static website, interactive website and transactive website adopters. The table below shows the mean scores for each benefit in each level of e-commerce adoption.

**Table 5-67**: The Mean Scores for the E-commerce Benefits

| Level EC adoption | | a | b | c | d | e | f | g | h | i | J | k | l | M | n | o |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| e-mail | Mean | 4.14 | 3.65 | 3.44 | 3.86 | 3.62 | 3.43 | 3.73 | 3.90 | 4.32 | 3.90 | 4.11 | 4.08 | 3.94 | 3.75 | 3.90 |
| | N | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 |
| | Std. Dev | .692 | .919 | .912 | .715 | .792 | .837 | .787 | .588 | .534 | .756 | .675 | .703 | .693 | .718 | .777 |
| Static Website | Mean | 4.34 | 3.85 | 3.52 | 3.98 | 3.83 | 3.51 | 3.82 | 3.90 | 4.49 | 4.22 | 4.17 | 4.29 | 4.02 | 3.87 | 4.08 |
| | N | 93 | 93 | 93 | 93 | 92 | 93 | 93 | 93 | 92 | 92 | 92 | 92 | 92 | 93 | 93 |
| | Std. Dev | .684 | .896 | 1.00 | .859 | .807 | .904 | .793 | .848 | .545 | .708 | .656 | .638 | .695 | .811 | .783 |
| Interactive Website | Mean | 4.54 | 3.99 | 3.34 | 3.88 | 3.87 | 3.44 | 3.72 | 4.00 | 4.62 | 4.30 | 4.25 | 4.38 | 4.00 | 3.84 | 4.28 |
| | N | 68 | 68 | 68 | 68 | 68 | 68 | 68 | 68 | 68 | 66 | 68 | 68 | 68 | 68 | 68 |
| | Std. Dev | .584 | .855 | 1.045 | .970 | .845 | .835 | .861 | .753 | .519 | .701 | .720 | .599 | .864 | .840 | .643 |
| Transactive Website | Mean | 4.46 | 3.97 | 3.72 | 3.69 | 3.79 | 3.54 | 3.67 | 3.97 | 4.56 | 4.00 | 4.05 | 4.44 | 4.05 | 3.85 | 4.10 |
| | N | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 |
| | Std. Dev | .600 | .903 | .916 | 1.104 | .767 | .790 | .838 | .743 | .552 | .688 | .647 | .552 | .605 | .709 | .641 |
| Total | Mean | 4.37 | 3.86 | 3.48 | 3.88 | 3.78 | 3.48 | 3.75 | 3.94 | 4.49 | 4.13 | 4.16 | 4.29 | 4.00 | 3.83 | 4.09 |
| | N | 263 | 263 | 263 | 263 | 262 | 263 | 263 | 263 | 262 | 260 | 262 | 262 | 262 | 263 | 263 |
| | Std. Dev | .662 | .896 | .984 | .898 | .808 | .851 | .814 | .749 | .545 | .729 | .676 | .642 | .727 | .780 | .736 |

he table above shows that the mean scores for each benefit perceived by the SMEs in different levels of e-commerce adoption are varied, starting from the lowest, 3.34, to the highest, 4.62. The top benefits with the highest mean scores reported by the SMEs in *e-mail adopters group* are:

Benefit i: extending market reach 4.32

Benefit a: increased sales 4.14

Benefit k: improved external communication 4.11

Benefit l: improve company image 4.08

Benefit j: improved speed processing 3.9

The top benefits with highest mean scores reported by the SMEs in *static website group* are:

| | |
|---|---|
| Benefit i: extending market reach | 4.49 |
| Benefit a: increased sales | 4.34 |
| Benefit l: improve company image | 4.29 |
| Benefit j: Improved speed processing | 4.22 |
| Benefit k:improved external communication | 4.17 |

Then, in *interactive website group*, the SMEs report the top five benefits as follow:

| | |
|---|---|
| Benefit i: extending market reach | 4.62 |
| Benefit a: increased sales | 4.54 |
| Benefit l: improve company image | 4.38 |
| Benefit j: Improved speed processing | 4.30 |
| Benefit o: increased employee's productivity | 4.28 |

While, the SMEs in the *transactive website* group report the following benefits as the highest mean scores

| | |
|---|---|
| Benefit i: extending market reach | 4.56 |
| Benefit a: increased sales | 4.46 |
| Benefit l: improve company image | 4.44 |
| Benefit o: increased employee's productivity | 4.10 |
| Benefit k: improved external communication | 4.05 |

From the scores reported above it can be shown that there are six e-commerce benefits that are consistently mentioned by SMEs at all levels/groups. The six benefits are: extending market reach (benefit i), increased sales (benefit a), improved external communication (benefit k), improve company image (benefit l), improved speed processing (benefit j), and increased employee's productivity (benefit o). It seems that the mean scores of these six benefits reported by the SMEs tend to increase by the increase of the level of e-commerce adoption. For example, the mean score of extending market reach (benefit i) reported by the SMEs in e-mail adopters is 4.32, while the mean scores reported by static

adopters and interactive adopters are 4.54 and 4.62. A similar pattern is also found on benefit a, l, k, j and o.

Even though the mean scores for these benefits tend to increase by the increase of the level of e-commerce adoption, however this does not means that the increase is statistically significant. To determine whether these scores are statistically differently significant or not, an ANOVA test was conducted.

### 5.5.3 The ANOVA test

The ANOVA test is a statistical techniques used to explore the differences between variables. According to Pallant (2013), there are two type of the ANOVA, which are between group ANOVA and repeated-measures analysis of variances. The former is used for a study that has different participants or cases in each group, while the latter is used for a study that has the same participants in different situation. In this case, because the participants of each group in this study are different, hence in this research the former is the correct choice.

Table 5-68 presents the mean score of the six e-commerce benefits reported by the Indonesian SMEs in various level of e-commerce adoption.

It can be seen from the Table 5-68 that the mean score of the e-commerce benefits reported by the SMEs in different level e-commerce adoption are also different, in which the SMEs in the higher level of e-commerce adoption tend to report the greater mean scores of the e-commerce benefits. Although the differences apparently exist, however it doesn't means that they are also different statistically significantly. To determine whether the differences on mean score are statistically significant or no, the significance value of ANOVA test can be used.

In addition to Table 5-68, the ANOVA test also generated several tables, which are presented in Table 5-69 and Table 5-70.

**Table 5-68:** Statistic Descriptive

| | | N | Mean | Std. Deviation | Std. Error | Min | Max |
|---|---|---|---|---|---|---|---|
| benefit_a | e-mail | 63 | 4.14 | .692 | .087 | 2 | 5 |
| | static website | 93 | 4.34 | .684 | .071 | 2 | 5 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | interactive website | 68 | 4.54 | .584 | .071 | 3 | 5 |
| | transactive website | 39 | 4.46 | .600 | .096 | 3 | 5 |
| | Total | 263 | 4.37 | .662 | .041 | 2 | 5 |
| benefit_i | e-mail | 63 | 4.32 | .534 | .067 | 3 | 5 |
| | static website | 92 | 4.49 | .545 | .057 | 3 | 5 |
| | interactive website | 68 | 4.62 | .519 | .063 | 3 | 5 |
| | transactive website | 39 | 4.56 | .552 | .088 | 3 | 5 |
| | Total | 262 | 4.49 | .545 | .034 | 3 | 5 |
| benefit_j | e-mail | 63 | 3.90 | .756 | .095 | 2 | 5 |
| | static website | 92 | 4.22 | .708 | .074 | 2 | 5 |
| | interactive website | 66 | 4.30 | .701 | .086 | 3 | 5 |
| | transactive website | 39 | 4.00 | .688 | .110 | 2 | 5 |
| | Total | 260 | 4.13 | .729 | .045 | 2 | 5 |
| benefit_k | e-mail | 63 | 4.11 | .675 | .085 | 2 | 5 |
| | static website | 92 | 4.17 | .656 | .068 | 1 | 5 |
| | interactive website | 68 | 4.25 | .720 | .087 | 2 | 5 |
| | transactive website | 39 | 4.05 | .647 | .104 | 2 | 5 |
| | Total | 262 | 4.16 | .676 | .042 | 1 | 5 |
| benefit_l | e-mail | 63 | 4.08 | .703 | .089 | 2 | 5 |
| | static website | 92 | 4.29 | .638 | .067 | 3 | 5 |
| | interactive website | 68 | 4.38 | .599 | .073 | 3 | 5 |
| | transactive website | 39 | 4.44 | .552 | .088 | 3 | 5 |
| | Total | 262 | 4.29 | .642 | .040 | 2 | 5 |
| benefit_o | e-mail | 63 | 3.90 | .777 | .098 | 1 | 5 |
| | static website | 93 | 4.08 | .783 | .081 | 2 | 5 |
| | interactive website | 68 | 4.28 | .643 | .078 | 3 | 5 |
| | transactive website | 39 | 4.10 | .641 | .103 | 3 | 5 |
| | Total | 263 | 4.09 | .736 | .045 | 1 | 5 |

**Table 5-69**: Test of Homogeneity of Variances

| | Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|---|
| benefit_a | .747 | 3 | 259 | .525 |
| benefit_i | 1.036 | 3 | 258 | .377 |
| benefit_j | 1.873 | 3 | 256 | .135 |
| benefit_k | 1.943 | 3 | 258 | .123 |
| benefit_l | .400 | 3 | 258 | .753 |
| benefit_o | .396 | 3 | 259 | .756 |

**Table 5-70**: ANOVA

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| benefit_a | Between Groups | 5.695 | 3 | 1.898 | 4.500 | .004 |
| | Within Groups | 109.263 | 259 | .422 | | |
| | Total | 114.958 | 262 | | | |
| benefit_i | Between Groups | 3.196 | 3 | 1.065 | 3.700 | .012 |
| | Within Groups | 74.288 | 258 | .288 | | |
| | Total | 77.485 | 261 | | | |
| benefit_j | Between Groups | 6.534 | 3 | 2.178 | 4.255 | .006 |
| | Within Groups | 131.020 | 256 | .512 | | |
| | Total | 137.554 | 259 | | | |
| benefit_k | Between Groups | 1.180 | 3 | .393 | .859 | .463 |
| | Within Groups | 118.087 | 258 | .458 | | |
| | Total | 119.267 | 261 | | | |
| benefit_l | Between Groups | 4.203 | 3 | 1.401 | 3.498 | .016 |
| | Within Groups | 103.328 | 258 | .400 | | |
| | Total | 107.531 | 261 | | | |
| benefit_o | Between Groups | 4.627 | 3 | 1.542 | 2.912 | .035 |
| | Within Groups | 137.183 | 259 | .530 | | |
| | Total | 141.810 | 262 | | | |

Table 5-69, which is Test of Homogeneity of Variances table, provides information about Levene statistic, degree of freedom and the significance value. These information are used to identify whether a variant on scores of each groups are the same or not. In this case, it is desired that there is equality in the variance of scores in each groups. According to Pallant (2013), if the significance value is greater than 0.05, it means that the homogeneity of variance exists, however, if the significance value is less than 0.05, it means that there is differences between variances in population.

Based on table above, it can be seen that the significance value of homogeneity test for all benefits are greater than 0.05. These values reflect that the assumption of homogeneity of variance has been met.

Table 5-70 shows the ANOVA table. This table provides sum of squares, degree of freedom, means square, F and significance value for both between groups and within groups. Among these values, the significance value is the value that needs

to be considered. As mentioned earlier, this value can be used to determine whether there is a statistically significantly differences in mean scores of dependent variables between groups or not. If the significance value is less than 0.05, it means that the differences on mean scores of dependent variables are statistically significant, however, in contrast if the significance value is greater than 0.05, it means that the differences on mean scores are not statistically significant.

In this case, the table above shows that the significance values of all benefits are less than 0.05, except for benefit k with the significance value of 0.463. This means that there are significant differences between the mean scores of the all benefits except for benefits k.

Even though the ANOVA table provides the information about the significance of mean scores differences, however this table cannot provide information about which group is different from which other groups. The information about this is only presented in the Table 5-71 below.

It is shown in the Table 5-71 that for the benefits a (increased sales), the statistically significantly differences only exist on the e-mail, static website and interactive website groups. In this case, the mean scores for the *benefit a* reported by the SMEs in e-mail adopters (with mean = 4.14 and SD = 0.692) is significantly different with the mean scores reported by interactive websites adopters (with mean = 4.54 and SD = 0.584) and static website adopters (mean = 4.34 and SD = 0.684).

**Table 5-71:** Multiple Comparisons

| Dependent Variable | (I) Level EC adoption | (J) Level EC adoption | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| benefit_a | e-mail | static website | -.201 | .106 | .231 | -.48 | .07 |
| | | interactive website | -.401* | .114 | .003 | -.69 | -.11 |
| | | transactive website | -.319 | .132 | .078 | -.66 | .02 |
| | static website | e-mail | .201 | .106 | .231 | -.07 | .48 |
| | | interactive website | -.200 | .104 | .218 | -.47 | .07 |
| | | transactive website | -.117 | .124 | .779 | -.44 | .20 |
| | interactive website | e-mail | .401* | .114 | .003 | .11 | .69 |
| | | static website | .200 | .104 | .218 | -.07 | .47 |
| | | transactive website | .083 | .130 | .921 | -.25 | .42 |
| | transactive website | e-mail | .319 | .132 | .078 | -.02 | .66 |
| | | static website | .117 | .124 | .779 | -.20 | .44 |
| | | interactive website | -.083 | .130 | .921 | -.42 | .25 |
| benefit_i | e-mail | static website | -.172 | .088 | .207 | -.40 | .06 |
| | | interactive website | -.300* | .094 | .008 | -.54 | -.06 |
| | | transactive website | -.247 | .109 | .111 | -.53 | .04 |
| | static website | e-mail | .172 | .088 | .207 | -.06 | .40 |
| | | interactive website | -.129 | .086 | .440 | -.35 | .09 |
| | | transactive website | -.075 | .103 | .884 | -.34 | .19 |
| | interactive website | e-mail | .300* | .094 | .008 | .06 | .54 |
| | | static website | .129 | .086 | .440 | -.09 | .35 |
| | | transactive website | .054 | .108 | .960 | -.23 | .33 |
| | transactive website | e-mail | .247 | .109 | .111 | -.04 | .53 |
| | | static website | .075 | .103 | .884 | -.19 | .34 |
| | | interactive website | -.054 | .108 | .960 | -.33 | .23 |

| Dependent Variable | (I) Level EC adoption | (J) Level EC adoption | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| benefit_j | e-mail | static website | -.313* | .117 | .040 | -.62 | -.01 |
| | | interactive website | -.398* | .126 | .009 | -.72 | -.07 |
| | | transactive website | -.095 | .146 | .914 | -.47 | .28 |
| | static website | e-mail | .313* | .117 | .040 | .01 | .62 |
| | | interactive website | -.086 | .115 | .880 | -.38 | .21 |
| | | transactive website | .217 | .137 | .386 | -.14 | .57 |
| | interactive website | e-mail | .398* | .126 | .009 | .07 | .72 |
| | | static website | .086 | .115 | .880 | -.21 | .38 |
| | | transactive website | .303 | .144 | .157 | -.07 | .68 |
| | transactive website | e-mail | .095 | .146 | .914 | -.28 | .47 |
| | | static website | -.217 | .137 | .386 | -.57 | .14 |
| | | interactive website | -.303 | .144 | .157 | -.68 | .07 |
| benefit_k | e-mail | static website | -.063 | .111 | .942 | -.35 | .22 |
| | | interactive website | -.139 | .118 | .644 | -.44 | .17 |
| | | transactive website | .060 | .138 | .973 | -.30 | .42 |
| | static website | e-mail | .063 | .111 | .942 | -.22 | .35 |
| | | interactive website | -.076 | .108 | .896 | -.36 | .20 |
| | | transactive website | .123 | .129 | .779 | -.21 | .46 |
| | interactive website | e-mail | .139 | .118 | .644 | -.17 | .44 |
| | | static website | .076 | .108 | .896 | -.20 | .36 |
| | | transactive website | .199 | .136 | .462 | -.15 | .55 |
| | transactive website | e-mail | -.060 | .138 | .973 | -.42 | .30 |
| | | static website | -.123 | .129 | .779 | -.46 | .21 |
| | | interactive website | -.199 | .136 | .462 | -.55 | .15 |
| benefit_l | e-mail | static website | -.214 | .103 | .166 | -.48 | .05 |
| | | interactive website | -.303* | .111 | .033 | -.59 | -.02 |
| | | transactive website | -.357* | .129 | .031 | -.69 | -.02 |
| | static website | e-mail | .214 | .103 | .166 | -.05 | .48 |
| | | interactive website | -.089 | .101 | .816 | -.35 | .17 |
| | | transactive website | -.142 | .121 | .641 | -.46 | .17 |
| | interactive website | e-mail | .303* | .111 | .033 | .02 | .59 |
| | | static website | .089 | .101 | .816 | -.17 | .35 |
| | | transactive website | -.054 | .127 | .975 | -.38 | .28 |
| | transactive website | e-mail | .357* | .129 | .031 | .02 | .69 |
| | | static website | .142 | .121 | .641 | -.17 | .46 |
| | | interactive website | .054 | .127 | .975 | -.28 | .38 |
| benefit_o | e-mail | static website | -.171 | .119 | .478 | -.48 | .14 |
| | | interactive website | -.375* | .127 | .018 | -.70 | -.05 |
| | | transactive website | -.198 | .148 | .542 | -.58 | .19 |
| | static website | e-mail | .171 | .119 | .478 | -.14 | .48 |
| | | interactive website | -.204 | .116 | .296 | -.50 | .10 |
| | | transactive website | -.027 | .139 | .997 | -.39 | .33 |
| | interactive website | e-mail | .375* | .127 | .018 | .05 | .70 |
| | | static website | .204 | .116 | .296 | -.10 | .50 |
| | | transactive website | .177 | .146 | .621 | -.20 | .55 |
| | transactive website | e-mail | .198 | .148 | .542 | -.19 | .58 |
| | | static website | .027 | .139 | .997 | -.33 | .39 |
| | | interactive website | -.177 | .146 | .621 | -.55 | .20 |

For the benefit i (extending market reach), the significant differences are shown on the mean score reported by the SMEs in e-mail adopters group (with mean = 4.32 and SD = 0.534) and the mean score of static website adopters (with mean = 4.49 and SD = 0.545), while the mean scores reported by the other groups are not statistically significant.

Then, the table above also shown that the mean score of the benefit j (improved speed processing) reported by the SMEs in e-mail adopters (mean = 3.9 and SD = 0.756) is significantly different with the mean score reported by static website adopters (mean = 4.22 and SD = 0.708) and interactive website adopters (mean = 4.30 and SD = 0.701).

Pointing out the benefits l (improve company image), the table shows that the significance different of the mean scores are shown on the scores reported by e-mail adopters (mean = 4.08 and SD = .703) with the scores reported by interactive website adopters (mean = 4.38 and SD = .599) and transactive website adopters (mean = 4.44 and SD = .552).

Finally, for the benefit o (increased employee's productivity), there is a significant difference on the mean scores reported by e-mail adopters (mean = 3.9 and SD = 0.77) with the mean scores reported by static websites adopters (mean = 4.08 and SD = 0.783) and interactive website adopters (mean = 4.28 and SD = 0.643).

Overall, ANOVA indicates that the benefits realized by the Indonesian SMEs tend to increase by the increase of the level of e-commerce adoption. Therefore, Hypothesis 12 (H12), which is *the higher level of e-commerce adoption by SMEs, the more likely for SMEs to perceive the greater benefits of e-commerce,* is supported in this study.

## 5.6 E-COMMERCE ADOPTION AND SMES PERFORMANCE

In order to investigate the relationship between the e-commerce adoptions with the SMEs performance, which is related to the fourth research objective, linear regressions was used. As described previously, the SMEs performance was

measured by using two indicators based on the self-reported perception of the SMEs owners.

There are fifteen questions asked in regard to the SMEs performance. Before performing the linear regression procedure, the fifteen items of questions were classified into similar groups based on the underlying construct. In this case, an exploratory factor analysis was performed.

### 5.6.1 Factor Analysis

As described previously, the factor analysis is a statistic technique used by a researcher in data reduction. In this procedure, the related variables are classified into a certain group. In this process, the principal component extraction technique by using varimax rotation was performed. As suggested by the literature, before performing the factor analysis, it is necessary to check whether the data set used in this analysis has met the factor analysis requirement, or not, by using the KMO and Bartlett's test.

The KMO and Bartlett's test result is presented in table below:

**Table 5-72**: KMO and Bartlett's Test

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .887 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 1569.026 |
| | Df | 78 |
| | Sig. | .000 |

The table above shows the KMO value is 0.887 and the significance value for Bartllett's test is 0.000. Both KMO and Bartlett's test indicate that the data has met the requirement for further factor analysis.

In the factor analysis only the items with factor loading 0.5 and above are retained in this analysis. Based on communalities value, there are two items that have a factor loading less than 0.5, which are *improved competitive position (benefit h)* and *improved external communication (benefit k).* As suggested by the literature, these two items are removed. Hence, 13 items are remaining for further analysis.

Based on eigenvalues, three factors are identified. These factors are presented in the following table.

**Table 5-73**: Rotated Component Matrix

| | Component | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| Improved supplier relationship | .800 | | |
| Increased employee's satisfaction | .790 | | |
| Reduced complain from client | .700 | | |
| Increased customer loyalty and retention | .636 | | |
| Improved internal communication` | .605 | | |
| Increased employee's productivity | .577 | | |
| Extending market reach | | .839 | |
| Improved company image | | .799 | |
| Increased revenue | | .633 | |
| Improved speed of processing | | .556 | |
| Reduced marketing costs | | | .826 |
| Reduced cost of purchasing and procurement | | | .764 |
| Reduced operation cost | | | .700 |

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

From the table above, it can be seen that the first factor consistsof six items, the second factor consists of four items and the third factor consists of three items. The six items in the first factor are improved supplier relationship, increased employee's satisfaction, reduced complain from client, increased customer loyalty and retention, improved internal communication and increased employee's productivity. All of these items are related to communication (internal and external), hence in the further analysis it is named as *communication.*

The second factor consists of four items, which are extending market reach, improved company image, increased revenue, and improved speed of processing. These items can be associated with market performance, therefore in this process it is labelled as *market performance.*

Then, the third factor consists of three items, which are reduced marketing cost, reduced cost of purchased and procurement and reduced operation cost. All of

these items are associated with cost reduction. Hence, the third factor is labelled as *cost reduction.*

The factor analysis result indicates that these performance indicators can be grouped into three groups, which are market performance, communication performance and cost reduction. Therefore, in further analysis, Hypothesis 13 was broken down into three hypotheses, which are:

Hypothesis 13(a) : E-commerce adoption by SMEs has a positive and significant relationship with SME's market performance

Hypothesis 13(b): E-commerce adoption by SMEs has a positive and significant relationship with the SME's communication performance

Hypothesis 13(c): E-commerce adoption by SMEs has a positive and significant relationship with the SME's cost reduction performance

### 5.6.2 The Relationship between E-commerce Adoption and Market Performance

In order to test a relationship between e-commerce adoption and market performance, simple regression is used. Table 5-74 below presents the model summary of liner regression model.

**Table 5-74:** The Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .213 | .045 | .042 | .49782 |

The table above shows that R value of this model is .213. As mentioned earlier, the R value reflects the simple correlation between the independent variable and dependent variable. While, the R square value represents an amount of variation in dependent variable that explained by the model. In this case, the R square value is .045, which means that this model can only explains 4.5% variability of the market performance, while the rest (95.5%) are explained by other variables.

The next step in regression analysis is to assess whether or not the regression model is statistically significant. In this regard, the F value and significance value can be used. Table 5-75 below, present the F value and significance value of the regression model.

**Table 5-75:** ANOVA

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Regression | 3.045 | 1 | 3.045 | 12.286 | .001[b] |
| Residual | 63.939 | 258 | .248 | | |
| Total | 66.983 | 259 | | | |

It can be seen from the table that the significance value of regression model is 0.001 (which less than 0.05). In this regard, the regression model of this research is statistically significant, which means that the in dependent variable involved in this model collectively has a significant correlation with the dependent variable.

Consistent with the table above, Table 5-76 below also shows that there is a positive and significant correlation between e-commerce adoption and market performance.

**Table 5-76**: Coefficient

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | 3.873 | .130 | | 29.840 | .000 |
| ECadoption | .047 | .013 | .213 | 3.505 | .001 |

The table above shows that the value of the unstandardized coefficients beta is positive 0.047, which means that every unit increase on the e-commerce adoptions, a 0.047 unit increased are expected from the market performance, holding other variables constant.Therefore, in this study the Hypothesis 13(a) is fully supported.

### 5.6.3 The Relationship between E-commerce Adoption and Communication Performance

The second performance in this research is the communication performance. The regression results for the relationship between e-commerce adoption and this performance are presented in the following tables.

**Table 5-77**: Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | .127 | .016 | .012 | .59898 | 2.033 |

**Table 5-78**: ANOVA

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 1.518 | 1 | 1.518 | 4.231 | .041 |
| | Residual | 93.281 | 260 | .359 | | |
| | Total | 94.799 | 261 | | | |

**Table 5-79**: Model Summary

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | 3.511 | .156 | | 22.572 | .000 |
| ECadoption | .033 | .016 | .127 | 2.057 | .041 |

Table 5-77 above provides information on the R value and R square value of regression model. It can be seen that the R value and the R square value of this model are .127 and .016. The R value reflects the absolute value of the Pearson correlation between ID and DV, while the R square value represents the portion of variance in dependent variable explained by the model. In this regard, the R square value of .016 means that in overall this model can only explains 1.6%, while the rest are explained by other variables.

Table 5-78 presents the F test and the significance value of the model. It shows that the F value of this model is 4.231, with .041 of significance value. These values represent that in overall the regression model is statistically significance. Therefore, in this study the Hypothesis 13(b) is fully supported.

Then, in table 5-79, the relationship between independent variable and dependent variable is shown. In this regard, it is shown that there is a positive and significant relationship between the e-commerce adoption with the communication performance. Every unit increased in the e-commerce adoption, it is expected that the communication performance will increase of 0.033, with all others variables is constant.

### 5.6.4 The Relationship between the E-commerce Adoption and Cost Reduction

The regression analysis procedure for e-commerce adoption and cost reduction is presented in the following tables..

**Table 5-80:** Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | .069[a] | .005 | .001 | .76334 | 2.091 |

**Table 5-81**: ANOVA

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | .719 | 1 | .719 | 1.234 | .268 |
| | Residual | 152.082 | 261 | .583 | | |
| | Total | 152.801 | 262 | | | |

**Table 5-82**: Coefficient

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 3.527 | .198 | | 17.825 | .000 |
| | ECadoption | .023 | .020 | .069 | 1.111 | .268 |

Table 5-80 shows the R square values of and the adjusted R square are 0.005 and 0.001. These value mean that this regression model can only explain 0.5% or 0.1% variability of the cost reduction, while the rest (99.5% or 99.9%) are explained by other variables.

The significance value presented in Table 5-81 is higher than 0.05, which is .268. This means that the regression model is not significance statistically, there is no significant relationship between independent variable and dependent variable. Consistent with this result, Table 5-82 also shows that the relationship between e-commerce adoption and cost reduction is not statistically significant. Therefore, in this study the Hypothesis 13(c) is not supported.

### 5.6.5 Interview Result

In regard to the e-commerce benefits, the sixteen SMEs owners/managers were asked about the benefits perceived by their organization regarding to the e-commerce technology. The following table presents the interview result in regard to the e-commerce benefits perceived by the Indonesian SMEs.

**Table 5-83:** The Benefits Perceived by the Indonesian SMEs

| The benefits | Number of Mention | % |
|---|---|---|
| Increased revenue/sales | 9 | 56.25 |
| Reduced operation cost | 2 | 12.5 |
| Reduced cost of purchasing and procurement | | |
| Reduced marketing costs | 6 | 37.5 |
| Increased customer loyalty and retention | 1 | 6.25 |
| Reduced complain from client | 1 | 6.25 |
| Improved supplier/customer relationship | 4 | 25 |
| Extending market reach | 13 | 81.5 |
| Improved speed of processing | 1 | 6.25 |
| Improved company image | | |
| Improved internal communication | 1 | 6.25 |
| Increased employee's satisfaction | | |
| Increased employee's productivity | 1 | 6.25 |
| Others: | | |
| New opportunity | 3 | 18.75 |
| Efficient in information searching | 4 | 25 |
| Easy to do business | 1 | 6.25 |

From the table above, it can be seen that extending market reach is the most frequent benefits mentioned by the SMEs owners/managers. Thirteen of sixteen interviewees mentioned it as the benefits of e-commerce perceived by their business. The second position is increased revenue/sales, in which 9 of 16 interviewees mentioned it. Then it is followed by others benefits, such as reduced marketing costs, improved supplier/customer relationship, efficient in information searching, reduced operation cost and others.

## 5.7 SUMMARY OF THE MAJOR FINDING BASED ON THE HYPOTHESES

Table 5-84 below presents that summary of research finding. Among the eleven factors proposed on this research as a determinant factor of the adoption of e-commerce by SMEs in Indonesia, six factors, which are perceived benefits, compatibility, technology readiness, owner/manager's innovativeness, IT experience and IT ability, are found as influencing factors in the adoption of the e-commerce by SMEs in Indonesia. Whilst other factors, which are cost, customer/suppliers pressure, vendor and government support, firm size and competitor pressure, are found to have no significant relationship with the e-commerce adoption.

Regarding to the e-commerce benefits perceived by the Indonesian SMEs, this research found that SMEs with the higher level of e-commerce adoption and the wider scope of e-commerce use were more likely to perceive the greater benefits (especially the benefits that related with the market performance) than those who are in the lower level of e-commerce adoption or narrower scopes of e-commerce use.

Furthermore, in regard to the relationship between the adoption of e-commerce with the SMEs performance, which is measured by three measures; market performance, communication performance and cost reduction, it is found that the e-commerce adoption has only a positive and significant relationship with the first

two, which are the market performance and the communication performance, but it does not have a significant correlation with cost reduction.

**Table 5-84**: Summary of Results of Hypotheses

| Hypotheses | | | Result |
|---|---|---|---|
| H1 | Perceived benefits | | Full support (+) |
| H2 | Perceived Compatibility | | Not supported |
| H3 | Cost | | Not supported |
| H4 | Technology readiness | | Full support (+) |
| H5 | Firm size | | Not supported |
| H6 | Customers and suppliers pressure | | Not supported |
| H7 | Competitor pressure | | Not supported |
| H8 | External support | | Full support (+) |
| H9 | Innovativeness | | Full support (+) |
| H10 | IT experience | | Full support (+) |
| H11 | IT ability | | Full support (+) |
| H12 | The level of e-commerce adoption and the benefits of e-commerce | | Full support |
| H13 | The EC adoption with | (a) Market performance | Full support (+) |
| | | (b) Communication | Full support (+) |
| | | (c) Cost reduction | Not supported |

# CHAPTER 6: ANALYSIS AND DISCUSSION

## 6.0 INTRODUCTION

This chapter discusses the analysis of the research findings that emerged in the previous chapter. This presents an interpretation of the result and their consistency with previous studies. It starts by describing and briefly recapping the characteristics of the sample, including the profile of SMEs and the profile of respondents who participated in this study, in section 6.1.

Then the analysis of the findings are discussed separately for each of the research objectives. The first research objective, which relates to the current condition of e-commerce adoption by SMEs in Indonesia, is discussed in section 6.2. Then, the second objective, which relates to the determinant factors of the e-commerce adoption, is discussed in section 6.3; and it is followed by the analysis and discussion of the third research objective, which relates to the benefits of e-commerce adoption, in section 6.4. The analysis of the findings regarding the fourth research objective is presented in section 6.5. Finally, this chapter is summarized in section 6.6.

## 6.1 CHARACTERISTIC OF THE SAMPLES: RESPONDENTS AND COMPANIES

This section discusses how representative is the sample of the relevant business population in Indonesia.

### 6.1.1 Respondents Gender, Age, and Education Level

As shown in the previous chapter, the number of male respondents in this study is three times the number of female participants, 72.4% of respondents are male and the rest (27.6%) are female. This condition would suggest that the majority of SMEs owner/managers in Indonesia are male. This is considered to represent the actual condition. According to a World Bank Enterprise survey (Mourougane, 2012), the percentage of female top managers in IndonesianSMEs is 30%, while for male top managers it is around 70%. This proportion is not only found in

small companies, but also found in large companies and other organization or institutions.

In addition, according to the Indonesian Minister for Women's Empowerment, Linda Amalia Gumelar, (2011), the number of female entrepreneurs in Indonesia is still low, which is 0.1% of the total population. Therefore, it is not surprising that the number of female managers/owners in SMEs or other organization are far behind the number of males.

This condition is not only found in Indonesia, but it is also commonly found in many other countries. For example, in the study by Thi and Lim (2011), the number of male managers who participated was three times that of female managers. Then, in study conducted by Grandon and Pearson (2004b) concerning small and medium size business in US, the number of male managers who participated was twice that of female managers. Further more, in a study conducted by Saffu et al. (2008), the number of male SMEs managers/owners were nine times greater than female managers/owners.

Observing the respondents age, in this study, 11.3% respondents were aged below 25 years old, 38.5% respondents are aged between 25 – 34 years old, 38.5% respondents between 35-44 years old, and 10.6% between 45-55 years old, and the remaining, 1%, are above 55 years old. It can be seen that the respondents between the ages 25 to 44 dominate, which indicates that the majority of SMEs owners/managers in Indonesia are aged between 25-44 years old. One of possible explanations for this condition is that mainly young people in Indonesia complete their bachelor/undergraduate study aged between 22 to 25 years old, and they need 4 to 8 years to work in business to get enough experience. In addition to this, generally retirement in Indonesia is starting at 55 years old, so usually the business owners who have reached retirement will hand over their business to their children. Hence, it is not surprising that the majority of the SMEs owners/managers are aged between 25-44 years old, and only a few are aged over 55 years old.

Pointing out the respondent's educational level, this study shows more than half respondents (56.1%) were graduated from a bachelor/undergraduate degree, 17.6 % graduated from Diploma degree, 19.6% respondents were graduated from junior and senior high school and only 6.7% respondents had completed their master/doctoral degree. This finding indicates that mostly the SMEs owners/managers are well educated people.

### 6.1.2 The SMEs Profiles: Firm Size, Industry Types and Location

As demonstrated in the previous chapter, among the 301 bussineses who participated in this study, 34.6% were classified as micro businesses; 48.5% were small businesses and 16.9% were medium businesses. This composition is considered representative of the actual proportion of the SMEs in Indonesia. According to data provided by the *Indonesian Ministry of Cooperatives and Empowerment of Small Medium Enterprises* (Kementrian Koperasi dan Usaha Kecil dan Menengah Republik Indonesia), the numbers of micro and small enterprises are much higher than the number of medium businesses.

The majority of SMEs who participated in this study are SMEs from trade, hotel and restaurant industry (51.1%), then it is followed by SMEs from manufacturing industry (24.6%), finance, rent and service industry (18.3%), agribusiness industry (2.3%), construction industry (1.7%) and the rest are from transport and communication, electricity, gas and water supply industries. In reality, based on data provided by *Indonesian Ministry of Cooperatives and Empowerment of Small Medium Enterprises* (Kementrian Koperasidan Usaha Kecil dan Menengah Republik Indonesia) and *Central Bureau of Statistics* (Badan Pusat Statistics), the first largest industry in which the SMEs are involved is the agribusiness industry, then the second and third largest sectors are trade, hotel and restaurant and manufacturing industries respectively. Then, if SMEs are further broken down into micro, small and medium business, the above composition is changed. For micro businesses, mostly they are involved in agribusiness, and it is followed by trade, hotel and restaurant industry, and agribusiness. While, for small and medium businesses, the majority of them are engaged in trade, hotel and

restaurant industry, then it is followed by the manufacturing and finance, rent and service. Based on these, it can be concluded that the majority of SMEs are involved in four main sectors, which are the trade, hotel and restaurant; manufacturing; finance, rent and service; and agribusiness industries. Therefore, the composition of industry sectors in this study can be considered to represent the real condition of SMEs in Indonesia.

In regard to location, SMEs who participated in this study were mostly based on Java island (78.4%), followed by the SMEs based on Sumatera island (16.6%), Bali (3%), Sulawesi (1%) and the rest were from Lombok and Kalimantan. Two main reasons are introduced regarding these numbers. Firstly, Java is the most populated island in Indonesia, and it is followed by Sumatera, so a lot of businesses are located on these islands. Secondly, Java is a centre of government in Indonesia, and Java is the capital city of Indonesia. Therefore, it is not surprising that the majority of businesses in Indonesia are in Java.

## 6.2 THE FIRST OBJECTIVE: TO INVESTIGATE THE EXTENT OF THE ADOPTION OF E-COMMERCE BY INDONESIAN SME

This section discusses the research finding that related to the first objective, which is the extent of the adoption of e-commerce in Indonesian SMEs. As presented in previous chapter, 93% respondents who participated in this study are e-commerce adopters, while the rest, 7%, are non e-commerce adopters. The analysis and discussion for both groups are presented separately in this section.

### 6.2.1 E-commerce Adopters

#### *6.2.1.1 Level of E-commerce Adoption*

In total 280 SMEs in this study are recognized as e-commerce adopters, in which 102 SMEs (36.5%) are micro businesses, 129 SMEs (46%) are small businesses and 49 SMEs (17.5%) are medium sized businesses. As described previously in Chapter Four, the adoption of e-commerce by an organization can be classified into several levels/stages, starting from the basic level to the sophisticated level. In this study, the e-commerce adopters are classified into six levels, which are e-

mail adopters, static websites adopters, interactive websites adopters, transactive websites adopters, internal integration and external integration.

Observing the level of e-commerce adoption in the Indonesian SMEs, this study shows that 22.9% SMEs who are e-commerce adopters are e-mail adopters, 35.7% SMEs are static website adopters, 26.4% SMEs are interactive websites adopters, 14.3% SMEs are transactive website adopters, 0.7% SMEs are internal integration adopters and no SMEs are in external integration adopters. Comparing to SMEs in developed countries, the level of e-commerce adoption by the Indonesian SMEs is still far behind. However, if it is compared with other developing countries, a similar condition is commonly found. For example, in the study conducted by Kabanda and Brown (2015) in Tanzania, among thirty two SMEs who participated in interview processes, 16% of them had no website, and 63% of them had reached thevinitial stage of adoption (in this case static website adoption), and the rest (22%) are interactive website adopters. In Malaysia, 33.7% of the 98 SMEs who participated in study conducted by Shaharudin et al. (2012) have no internet access, and it is only 24.5% SMEs that have a website. A recent study conducted by Kurnia, Choudrie, et al. (2015) also confirmed that in Malaysia the level of e-commerce adoption by SMEs is still low. Among 125 SMEs who participated in that study, on average only 20% of them are e-commerce technologies adopters (such as: e-mail, internet, intranet, extranet, EDI, EFT and barcode).

A similar condition is also shown in Srilanka. Among the 81 SMEs who participated in the Senarathna, Warren, Yeoh, and Salzman (2014) study, 16.4% of them have connection to the internet and mainly use it just for external information search, while 47% have used it for internal and external communication. Then, 22% SMEs already have a website (static and interactive) and only 9.6% SMEs that have a transactive website.

In a study in Saudi Arabia, conducted by Al-Somali, Gholami, Clegg, and Bennett (2015), e-commerce adoption by businesses (both small and large businesses) is still at a low level. According to this study, among 201 businesses

(32.7% are SME and 67.3% are large businesses) who participated, 19.8% businesses have connected to the internet and used e-mail; 16.8% businesses have adopted static website; 32.7% businesses have adopted an interactive website; 6.4% businesses have adopted a transactive website; and 24.3% businesses have adopted an integrated website. In Portugal, based on a survey conducted by Gonçalves, Santos, and Morais (2010), it was found that 92% of SMEs have a website, and only 8% of SMEs had no website. Similarly, evidence from South Africa also showed that 38.67% of 150 SMEs who participated in Molla and Heeks (2007) were non e-commerce users, while 61.33% SMEs were e-commerce users. Among e-commerce users, 21% of them had a static website, 47% SMEs had an interactive website, 24% SMEs had a transactive website and only 7% had a integrated website.

The low levels of adoptions of ICT in general, and, e-commerce in particular, by SMEs in developing countries are caused by several factors. Kotelnikov (2007) revealed that poor communication infrastructure, lack of ICT knowledge, lack of IT resources, lack of financial resources and legal infrastructure are some factors that lead to low adoption of ICT by these SMEs. More specifically, Kartiwi and MacGregor (2008) found that the low level of e-commerce adoption by SMEs in Indonesia were caused by several barriers, of which the five highest barriers mentioned were that "e-commerce is not suited to our product", "e-commerce does not offer any advantages to our organization", "e-commerce is not suited to our way of doing business", "e-commerce is not suited to the way of our clients" and lastly that "e-commerce is not secure".

#### *6.2.1.2 The Length of E-commerce Adoption*

Pointing out the length of e-commerce adoption, this dissertation shows that the majority of the Indonesian SMEs (72.14%) have adopted e-commerce for three years and less, while 27.86% of them have adopted e-commerce for more than four years. This condition reflects that the adoption of e-commerce by SMEs in Indonesia is still relatively new.

Even though e-commerce technology has been introduced in Indonesia since 1996; this technology has only been widely known in recent years. According to the International Communication Union (2007), in 2007 the average values of some indicators of ICT development in Indonesia were still far behind than the average values of Asia and the world. In addition to this, the Nielson Global online survey conducted in 2008 showed that Indonesia was on the bottom position (number 13 from 14 countries) in Asia Pacific in terms of on line transactions. However, this position has significantly changed since 2010. In that time, the Indonesian government through the Ministry of Communication and Information Technology (Kementrian Komunikasi dan Informatika) issued a policy regarding to provide affordable internet access for rural communities by relying on satellite connections (Donny, 2014).

In addition to this, in 2011 the Indonesian government had issued also Government Regulation Number 10 (Peraturan Pemerintah No. 10) about the ICT fund, which aimed to increase internet access penetration and distribution and access to broadband service; to encourage the development of content applications in various sectors; and to encourage the development of society's ability to use ICT as a means to improve the efficiency and effectiveness of community activities ("Pemanfaatan Pembiayaan Teknologi Informasi dan Komunikasi (ICT Fund)," 2011). These regulations have certainly had a positive impact on the development of ICT in general, and e-commerce in particular, in Indonesia. Therefore, it is reasonable to see that mostly the SMEs have adopted e-commerce technology within the last three years or so.

#### *6.2.1.3 The Numbers of IT Personnel*

Due to the low level of e-commerce adoption by SMEs in Indonesia, it is not surprising to see that 54.28% of SMEs just have one or two IT specialists. It might be because of the scope of business of Indonesian SMEs is not too broad, and the business activities are not too complex, so it does not require a lot of IT specialists. Also 27.85% of SMEs reported that they do not have an IT employee. The lack of financial resources can be a reason for this condition, in which the

SME cannot afford to hire an IT specialist. Therefore, those owners who have enough IT knowledge usually acted as their "own" IT staff. This condition is supported by the interview results. Based on the interview results it was found that 10 of the 16 SMEs who have adopted the e-commerce technology do not employ IT staff, and all of activities that related to this technology is handled directly by the owner.

Some of responses from the interviewees regarding to this condition are presented below.

*....I am used to using computer since I was in senior high school and I had attended a computer course. In addition, I also have joined the IT training organized by local government. So, I have enough capabilities in computer field. I designed my company websites by myself....*

The owner of company X

*....I graduated from IT and computer sciences, and I have enough knowledge about IT. So I can create, design and manage my company website by myself.....*

The owner of company XIII

*...I build my company website by myself. I learned IT independently. Currently, there are many sites providing guidance in creating a company website...*

The owner of company XIV

Although this study reported that the majority of SMEs in Indonesia have only employed two or less IT specialists, however this study also found that 13.57% of SMEs have employed three to five IT specialist and even 4.28% of SMEs already have more than five IT specialists.

#### *6.2.1.4 The Activity Involved in E-commerce Use*

Because the majority of SMEs who participated in this study are websites adopters (static, interactive or transactive websites), it is reasonable to have found that 82% of SMEs use e-commerce for marketing purposes or in marketing activities. As described in the e-commerce literature, a website is mainly use by SMEs to attract new customers and expand their local market (Mustaffa and Beaumont, 2004). One previous study conducted by the Asian Foundation in

2002 also found that majority of SMEs (74%) in Indonesia developed their website to promote and market their product.

In addition to this, this study also found that 30.6% of SMEs use the e-commerce technology for purchasing and procurement activities; 23.6% of SMEs use it for after sales services, 22.9% SMEs use it in financial activities, 21.3% SMEs use it in logistics and distribution activities and only 15.9% of them use it in operational and processing activities. This is in line with the Daniel and Wilson (2002) study. It was mentioned by them that e-commerce helps an SME in many activities, such as providing information about the company, providing information about goods and services offered, identifying suppliers and taking and placing orders (Daniel and Wilson, 2002).

### 6.2.2 Non E-commerce Adopters

Twenty-one SMEs who participated in this study have not yet connected to the internet, and they also do not have an e-mail. Among them, 36% SMEs admitted that they are in this condition for more than four years, 42.8% SMEs reported that this condition has been going on since two or three years ago, and the rest reported that this condition has been going on for one year or less. It can be seen that even though e-commerce has grown significantly in Indonesia since 2010, however, there are still a number companies, especially SMEs, that do not adopt the e-commerce. Interestingly, the majority of them come from Java island (57% or 12 SMEs), which is a centre of government in Indonesia and also an urban area which certainly has an adequate IT network facilities. In this regard, therefore, the bad IT network facilities should be not a main reason for the Indonesian SMEs not to adopt the e-commerce. This is supported by the interview result. Based on the interview result, none of that SMEs mentioned that the low qualities of IT network facilities as a factor that hindered them in theadoption of e-commerce (see Table 5-44, page 197). The following is the response given by one of company owners related to the barriers of e-commerce adoption.

*…there are many factors that hinder me to adopt e-commerce technology. First I did not have enough money to buy a laptop or internet subscription. If there was, then I prefer to use it to buy raw materials. Secondly, I just graduated from high*

*school and I did not have computer skills, so I cannot operate the computer by myself. Third, I did not enough money to hire an IT specialist. Fourth, my business is a micro business, with limited production capacity, so if I sell online, then I am afraid I cannot fulfil all the orders….*

The owner of company XV

As mentioned in Chapter Five, six of non e-commerce adopters participated in the interview process. Surprisingly, among them only one SME had never adopted the e-commerce technology, while the other five are those who had adopted but they have already stopped using the e-commerce several years ago. The later in this study are identified as "lapsed e-commerce adopters". Because of this study did not specifically set out to address this phenomena, the discussion of "lapsed e-commerce adopter" is limited only to the factors that caused them to stop e-commerce adoption. However, it cannot be denied that this condition is certainly interesting to be studied, and it could be an interesting topic for future studies.

In regard to the "lapsed adopters", based on interview result, several factors such as a lack of response from customers, a lack of financial resources, the lack of IT ability and the low intention of SMEs owner are identified as the factors that hinder the "lapsed adopters" in adoption of e-commerce technology.

Below are several responses given by them regarding the e-commerce adoption.

*…..I stopped using my blog since two years ago, because I did not receive any order from it. There was only one or two prospective buyers who ask about my products, but the just asked and they did not show interest to buy my products….*

The owner of company II

*..I did not have the time to manage and maintain my website. There was no IT specialist in my businesses, so that's why I stopped using my previous website…*

The owner of company V

It can be seen from the responses above that one of the reasons given by the lapsed adopters is they did not received benefits from the e-commerce technology as informed in e-commerce literature. Some empirical evidence has shown that the adoption of e-commerce is not always beneficial to the business as described in the e-commerce literature. For example, Paré (2003) found that e-commerce

applications did not contribute toward transaction cost reduction for B2B e-hubs. Then, Humphrey, Mansell, Paré, and Schmitz (2003) reported that business in three developing countries did not feel the reduction in cost as mentioned by e-commerce literature. In addition to this, Molla and Heeks (2007) found that the use of e-commerce technology by businesses in South Africa did not reduce their costs significantly. Such e-commerce failure could be a reason for business, especially SMEs, to stop their e-commerce adoption. This is reasonable, because business tend to adopt a certain innovation that offers a greater benefits than its cost, and vice versa.

## 6.3 THE SECOND OBJECTIVE: TO IDENTIFY FACTORS THAT INFLUENCE THE INDONESIAN SMES IN ADOPTING OF E-COMMERCE

This section discusses the hypotheses testing result regarding the factors that influence the Indonesian SMEs in adoption of e-commerce technology. There are eleven factors proposed in this study as the determinant factors of e-commerce adoption, which are perceived benefits, compatibility, cost, technology readiness, firm size, customers/suppliers pressure, competitor pressure, external support, managers/owners innovativeness, managers/owners IT experience and managers/owners IT ability.

The analysis of research finding of each of factors is discussed separately in the following sub section.

### 6.3.1 Perceived Benefits

*Hypothesis 1*: Perceived benefits positively influences the adoption of the e-commerce by Indonesian SMEs

*Key Finding*: The perceived benefits has a positive and significant correlation with the e-commerce adoption by the Indonesian SMEs

As presented in Chapter Five, the questionnaire result, analysed by using multiple regression, showed that the regression coefficient for the *perceived benefit* is positive 0.106 with 0.000 significance.

This result implies that perceived benefits is considered by SMEs in Indonesia as a factor that influence them in adopting of e-commerce. This result is also supported by the interview finding. Fourteen out of the sixteen interviewees mentioned that perceived benefit is one of the factors that encourage them in the adoption of the e-commerce technology. The following presents some of responses given by the interviewees in regard to the perceived benefits.

*…..in my opinion, I can expand my market place through the e-commerce technology. I have a dream that if people come to Padang, they only remember crisps from our company…*

The owner of company I

*…..I think a lot of advantages we can get from the e-commerce, the market share becomes wider, in which customers could be from anywhere, it allows us to communicate with our suppliers or customers easily and it allows us to obtain new information…*

The owner of company IV

*… Electronic commerce allows me to work from home. I can sell my products at any time and without having a store…*

The owner of company VII

*…I think it would be a great opportunity for my business if I can sell my products through the website….*

The owner of company VIII

*….I've read a few articles about the benefits of e-commerce, therefore, I became interested to apply it in my business….*

The owner of company XI

This finding can be explained theoretically. In behavioural theory, it is mentioned that the person's belief about the certain behaviour is one of determinant factors for him/her to follow such behaviour (Fishbein and Ajzen, 1975). The greater the person's belief that the certain behaviour will give a positive affect to themselves, the more likely he/she will follow such behaviour, and vice versa. Further, and more specifically, Davis (1989) also revealed that one of factors that caused people to accept or reject IT is their degree of belief that the IT will assist them to do their job better than before. The greater people's belief that IT can assist them, the more likely they will accept the IT, and vice versa. In line with this, the

innovation theory also mentions that the relative advantage of the innovation is one of the innovation attributes that determine the rate of adoption of innovation (Rogers, 1983). In this regard, the relative advantage refers to what extent the innovation is perceived as being better than previous ideas. The greater the owners belief about e-commerce benefits, the more likely they adopt e-commerce.

Based on these explanations, therefore, it is not surprisingly that in this research the perceived benefit is found as one of determinant factors in adoption of the e-commerce by the SMEs in Indonesia. This finding is also consistent with previous studies (Alam et al., 2011; Tan et al., 2009; Chong, 2008; Al-Qirim, 2007; Gibbs and Kraemer, 2004; Chwelos et al., 2001; Raymond, 2001; Poon and Swatman, 1999). Furthermore, Poon and Swatman (1999) found in their study that perceived benefits is a key reason for SMEs in Australia to adopt internet commerce. In their study, the benefits are grouped into two main categories, which are direct and indirect benefits; then these are further broken down into long term and short term benefits. This result confirmed Iacovou et al. (1995) study regarding EDI adoption in small organizations in British Colombia, Canada. In line with this, Premkumar (1999) also found that the perceived benefits as the only significant variable that differentiate the adopters and non-adopters of four communication technologies; on line data access, e-mail, EDI, and Internet, in small business in US.

In addition to this, recent studies such as Tiago and Maria (2010), Alam et al. (2011), Morteza et al. (2011), Ghobakhloo and Tang (2013) and Abou-Shouk et al. (2013) also found that the perceived benefits have a positive and significant correlation with the e-commerce adoption.

### 6.3.2 Compatibility

*Hypothesis 2*: Compatibility positively influences the adoption of e-commerce by Indonesian SMEs

*Key Finding*: The compatibility has a positive correlation with the e-commerce adoption by Indonesian SMEs; however this correlation is not statistically significant.

The multiple regression result shows that even though the coefficient regression for this variable is positive 0.015, however because of the significance value of this variable is greater than 0.05 (0.774) then this variable is considered not to have a significant effect on the adoption of e-commerce by the Indonesian SMEs. Simply, it means that compatibility is not considered by SMEs in Indonesia as a factor that influence them in adopting of e-commerce.

This result is also supported by the interview results. Among the sixteen interviewees who have already adopted e-commerce technology, none of them mentioned compatibility as a factor that influences them in regard to the e-commerce adoption.

Even though innovation theory informs us that an innovation will be easily accepted in organization if the innovation is in accordance with the organizations existing values and culture and able to meet the company needs, previous studies have delivered inconsistent results about this. For example, Beatty et al. (2001), Tan et al. (2009), Gilaninia et al. (2011), El-Gohary (2012), Grandon and Pearson (2004b), Le et al. (2012) found that the compatibility (technological or organizational) has significant correlation with the adoption of e-commerce technology. However, on the other hand, studies conducted by Al-Qirim (2007), Lin and Lin (2008), Ramdani et al. (2009) and Li et al. (2010) found that this variable does not have a significant correlation with the adoption of IT technology, in general and e-commerce in particular.

In the study conducted by Premkumar and Roberts (1999), which aimed to investigate the factors that influence small business in the US in their adoption of some technologies; online access, e-mail, internet, and EDI, compatibility was only found as the determinant factor the adoption of online access, but not on the e-mail, EDI or internet adoption. Slightly similar, Al-Qirim (2005) also found that the compatibility only has a significant influence on the adoption of intranet, extranet, internet-EDI and websites, but not on the adoption of internet and external e-mail.

The insignificant result of this variable in this research might be caused by a factor that related to the characteristics embedded in the SME. As explained by Zhu and Kraemer (2005), one of the characteristics that differentiate between the large business and the SME is organizational inertia, in which the SME is more agile and flexible than the large business. This condition suggests that the SME can be more responsive to adapt to the new innovation, including the e-commerce. So SMEs do not too worry about whether the new innovation will be compatible with technology, culture, value or work practices that already exist in their organization. In addition to this, Ramdani et al. (2009) also mentioned that the insignificant influence of the compatibility on the adoption of IT innovation might be because SMEs do not have so many application in their business so they do not worry about integrating their existing applications with the new one. This condition is in line with the conditions that found in the sample of this study, in which most of the SMEs who participated were still at low level in term of e-commerce adoption (just having e-mail, static or interactive webiste), so they were not too worried about compatibility of these technologies with their existing technology.

### 6.3.3 Cost

*Hypothesis 3*: Cost negatively influences the adoption of e-commerce adoption by Indonesian SMEs

*Key Finding:* The cost has no significant correlation with the e-commerce adoption by the SMEs in Indonesia.

The multiple regression result demonstrates that the regression coefficient value of this variable is 0.006 with the significance value greater than 0.05, which is 0.866. The small value of the regression coefficient and the significance value indicate that the cost is not considered by the Indonesian SMEs as the determinant factors in adoption of the e-commerce technology. This means that the SMEs in Indonesia perceived that the e-commerce technology is not costly. This result is not consistent with Sila (2013), Alam (2009) and Wymer and Regan (2005) study. However, this result is in accordance with the Al-Qirim (2007) and Morteza

(2011) studies, in which the cost did not have a significant correlation with the e-commerce adoption on the SMEs.

One possible explanation about this condition is that the prices of both hardware and software have decreased rapidly due to the emergence of powerful personal computers and the availability of software packages which are user friendly and ready to use (Palvia et al., 1994). To be able to connect to the internet or to do online trading no longer requires expensive computer hardware or software. It can be done by using simple technology such as a personal computer, tablet or smart phone. More importantly, currently, there are many cheap (or even free ) software available that can be used by companies, especially SMEs for various activities. In addition to this, the low level of e-commerce adoption by SMEs in Indonesia could be a reason for this condition. As described earlier, 85% SMEs who participated in this study are still in the earlier level (22.9% are e-mail adopters, 35.7% are static website adopters, and 26.4% are interactive website adopters), so they do not require a sophisticated and an expensive technology devices.

This is supported by the interview results, six of sixteen interviewees mentioned that the cost spend for the e-commerce technology is not that expensive for them. The following are some of responses given by the interviewees in regard to the cost of the e-commerce adoption.

*.....currently, the costs spend to design the website has been relatively affordable for me and also other SMEs. It does not need a sophisticated technology or expensive equipment.....*

The owner of company IV

*.....no significant obstacles regarding the cost of e-commerce adoption, because this technology can be got in cheaper and easier ways. Everyone can learn and every one can afford it. So, in my opinion there is no reason to not to do it...*

The owner of company IX

*.....in my opinion, currently the cost to create a website is very affordable. There have many been software or instructions about how to create or maintain the website available on the internet. So, the cost is not a significant issue for the SMEs nowadays.*

The owner of company X

*....costs for internet technology is not expensive, with just having a lap top and internet subscription (around IDR 120.000 per month) the virtual store can be created.....*

The owner of company XI

### 6.3.4 Technology Readiness

*Hypothesis 3*: Technology readiness positively influences the adoption of e-commerce by Indonesian SME

*Key Finding*: The technology readiness has a positive and significant relationship with the adoption of e-commerce by the Indonesian SMEs

In this study, technology readiness not only relates to the technology infrastructure but it also relates to the human resources. As presented in the previous chapter, the result of multiple regression analysis demonstrates that technology readiness has a positive and significant relationship with the e-commerce adoption, with the significance level close to 0.00 and the regression coefficient 0.169.

This result indicates that the technology readiness plays a significant role in adoption of the e-commerce technology by the Indonesian SMEs. This result is confirmed the previous studies, such as Gibbs and Kraemer (2004), Tiago and Maria (2010), Ramdani et al. (2013), Shah Alam et al. (2011), Le et al. (2012), and Thi and Lim (2011). Furthermore, in the study conducted by Zhu et al. (2006), technology readiness was found as the most critical factors in e-business adoption by business in developing countries. E-commerce literature mentioned that those companies that have adequate technology infrastructures, and sufficient IT skills would be more confident to bear the uncertainty regarding IT adoption than those who do not have those competencies (Tiago and Maria, 2010).

This condition is supported by the interview results. Twenty respondents participated in the interview process, 16 of them are e-commerce adopters and the rest, six, are non e-commerce adopters. Among non e-commerce adopters, five of them were e-commerce adopters several years ago. Most of them mention that the lack of IT infrastructure and an IT specialist as the main reason for them to stop

on line trading. Some responses from non e-commerce adopters group are presented below.

*....our main constraint is the absence of employees who understand IT. I, myself, do not have IT capabilities, and I do not have a time to learn about it. Might be that when our business is large enough, I can hire an IT specialist to do on line trading...*

The owner of company II

*....our main problem is lack of human resources to manage the websites. In addition to this, poor internet network connection makes on line trading difficult to be applied to our business.*

The owner of company III

*..our company has limited numbers of employees. None of them has a knowledge and ability regarding IT, and I, myself, am also not interested to do so...*

The owner of company V

### 6.3.5 Firm Size

*Hypothesis 5*: Firm size positively influences the adoption of e-commerce by Indonesian SMEs

*Key Finding*: Firm size has no significant correlation with the adoption of e-commerce by the Indonesian SME

The questionnaires analysed by multiple regression in this study show that the significance value of the firm size is greater than 0.05 (0.915), which means that the firm size does not have a significant correlation with the adoption of e-commerce.

The interviews result also supports this result. Among the twenty-two interviewees, none of them recognised firm size as the influencing factor in the adoption of the e-commerce.

Many previous studies recognized the firm size plays an important role in adoption of the IT (Le et al., 2012; Morteza et al. (2011); Chong, 2008; Tan et al., 2007; Zhu et al., 2006; Premkumar and Roberts, 1999). They argued that larger organizations have sufficient resources (technological, financial, and human resources), so they have a greater tendency to adopt new technology than the

smaller organization (Duan et al., 2012). However, in this study it is found that the Indonesian SMEs do not recognize the firm size as a factor that influences them in adoption of the e-commerce.

Several possible explanations are given for this condition. First, the Indonesian SMEs do not consider e-commerce technology an expensive technology. This is reasonable, because mostly the Indonesian SMEs are still at lower level in the adoption of e-commerce (see Table 5-7 in Chapter Five), in which most of them just have static or interactive website or even just have an e-mail. This technology is certainly less expensive than other technologies such as EDI. Second, as mentioned by Hsu et al. (2006), organizational inertia can also be associated with this condition. It cannot be denied that larger business have more resources to implement e-commerce technology than smaller business, however once a business passes a threshold of resources, business size does not have relevance anymore. In addition to this, Gibbs and Kraemer (2004) also mentioned that smaller busineses are also more agile and flexible in making changes according to requirements of technology adoption.

This study is consistent with Gibbs and Kraemer (2004). In their study, firm size was found not to a have a significant correlation with the scope of e-commerce use by businesses in ten countries; namely Brazil, China, Denmark, France, Germany, Japan, Mexico, Singapore, Taiwan and the United States. Duan et al. (2012) also found that the firm size did not play a significant role in adoption of e-market by SMEs in Australia. Similarly, Tiago and Maria (2010) likewise found that the firm size did not have a significant correlation with e-business adoption by businesses in 27 countries in European Union (EU).

### 6.3.6 Customers/Suppliers Pressure

*Hypothesis 6*: Customers/suppliers pressure positively influence the adoption of e-commerce by the Indonesian SMEs

*Key Finding*: The customer/suppliers pressure has positive correlation with the adoption of e-commerce; however this correlation is not statistically significant.

The regression coefficient and the significance values generated by the multiple regression procedure for this variable are 0.014 and 0.732. These values indicate the effect of this variable on e-commerce adoption is relatively small and also insignificant.

This implies that SMEs in Indonesia are not affected by the customer/suppliers regarding the adoption of e-commerce. Pressures from suppliers/customers are not strong enough to push the Indonesian SMEs to implement a high level of e-commerce adoption. This result is not consistent with previous studies, such as Le et al. (2012), Li et al. (2010) and Chong (2008).

It was mentioned by one national newspaper in Indonesia (Panji, 2014) that the majority customers in Indonesia are recognized as "online shopper with conventional manner", in which the customers visits online sites only just to see product offered, and if they are interested in it, they will place the order conventionally, through telephone, fax or even face to face. As a result, business in general, and SMEs in particular, are not compelled to apply a sophisticated technology or extended e-commerce technology. This condition might be one possible reason to explain why the customers/suppliers pressure does not play an important role in the adoption of e-commerce technology by the Indonesian SMEs.

This result is consistent with studies finding Al-Qirim (2005; 2007). In the Al-Qirim (2005) study, it was found that the customers/suppliers pressure did not play an important role in the adoption of all three main groups of the e-commerce technologies; e-commerce starter, e-commerce innovators, extended e-commerce, by the small business in New Zealand. In line with this, Al-Qirim (2007) also found that the customers/suppliers pressure did not play a significant role in the adoption of internet-internal e-mail, internet-external e-mail, intranet, extranet/VPN, internet EDI and website adoption by the small business in New Zealand.

### 6.3.7 Competitor Pressure

*Hypothesis 7*: Competitive pressure positively influences the adoption of e-commerce by Indonesian SME

*Key Finding*: The competitive pressure has no significant correlation with the adoption of e-commerce by the Indonesian SMEs

According to Table 5-59 presented in the previous chapter, the coefficient regression and significance values of this variable is negative 0.018 and 0.735, which mean that competitor pressure has no significant correlation with e-commerce adoption. This result implies that the competitive pressure is not considered by the SMEs in Indonesia as a main factor that drives them to adopt the e-commerce technology. This result is not consistent with Zhu and Kraemer (2005), Morteza et al. (2011), and Tiago and Maria (2010), however this result supports study finding conducted by Thong and Yap (1995), Thong (1999), Lee (2004), Ramdani et al. (2009), Scupola (2009) and Thi and Lim (2011).

Thong and Yap (1995) found that the competitive environment does not affect the decision of SMEs in Singapore to adopt IT. In a similar vein, Thong (1999) also found that the competitive pressure does not play a significant role in adoption of IS by the SMEs in Singapore. Thong (1999) justified the insignificant of this variable on IT or IS adoption because both adopters and non-adopters perceived that they existed in an equally competitive environment. Moreover, they revealed that the competitive pressure did not really provide a “direct push” for SMEs in Singapore to adopt the IS, but it provided an indirect affect to the IS adoption through the IS characteristics.

In line with this, Ramdani et al. (2009) also found that the competitive pressure has no significant correlation with enterprise system adoption by SMEs in the Northwest England. This result is also consistent with Lee (2004), in which the competitive pressure was found not to play an important role in the adoption of internet technology by small enterprises in the U.S. Lee (2004) arguing that the insignificant result finding were due to small businesses being more focused on other technology aspects than their competitive position. In addition to this, it was

suggested by Lee (2004) that the decision of SMEs were based on internally important factors.

### 6.3.8 External Support

*Hypothesis 8*: External support positively influences the adoption of e-commerce by Indonesian SMEs

*Key Finding*: The external support has a positive and significant correlation with the adoption of e-commerce by the Indonesian SMEs

The questionnaire result which analysed with multiple regression shows that the regression coefficient for the external support is positive 0.067 and the significance value of it is 0.040. These values mean that the external support has a positive and significant correlation with the adoption of e-commerce by the Indonesian SMEs, in which every unit increase in the external support will effect an 0.067 increase on the e-commerce adoption, holding all variables constant.

In line with the questionnaire result, the interview result also indicates that external support plays a significant role in adoption of the e-commerce technology by the Indonesian SMEs. In this case the support comes from both the IT vendor and the government. The IT vendor and government support is recognized by six (out of sixteen) interviewees as a factor that influenced them to adopt e-commerce technology. The following presents the responses of interviewees regarding to the IT vendor and government support.

*....I had joined a training course in regard to the use of IT in business activities which was organized by local government. This training was intended to introduce IT in SMEs, and it motivated me to learn more about IT....*

The owner of company X

*...in recent years, Solo government is being actively encouraged the SMEs to use the IT on their business activities. Many supports were provided by the government, some of which are to provide IT training, IT consultation and designed websites template for SMEs....*

The owner of company XI

*...I think that greater support from local government and also academics contributes to the increase of the number of SMEs who trade online, including me...*

The owner of company XIII

*.....our government encourages us as SMEs to apply the electronic commerce by providing IT training. Through such training we become aware that electronic trading offers many benefits to entrepreneurs like us.....*

The owner of company XX

*....another factor is the support of the IT vendor, in which they regularly provide training and assistance to our company. So that the difficulties encountered during e-commerce adoption can be resolved soon....*

The owner of company XXII

This finding is consistent with previous studies. Gibbs and Kraemer (2004) found that the government support plays a significant role in the adoption of e-commerce by businesses in ten countries; namely Brazil, China, Denmark, France, Germany, Japan, Mexico, Singapore, Taiwan and the United States. Then, Chong (2008) also found that the government support as determinant factor that influenced SMEs in Australia in adoption of the internet based e-commerce. A similar result was also found by Zhu and Kraemer (2005), Kuan and Chau (2001).

In regard to the IT vendor support, Morteza et al. (2011) found that the IT vendor support as the determinant factors in adoption of e-commerce by SMEs in Iran. Similar result were also found by Li et al. (2010) and Al-Qirim (2007) studies.

### 6.3.9 Owners/Managers Innovativeness

Hypothesis 9: Owners/managers innovativeness positively influences the adoption of e-commerce by Indonesian SMEs

Key Finding: The owners/managers innovativeness has a positive and significant correlation with the adoption of e-commerce

The regression coefficient and significance of this variable are 0.129 and 0.007, which mean that the owner/managers innovativeness has positve and significant correlation with e-commerce adoption. This finding implies that the

innovativeness is considered as key determinant factor for SMEs in Indonesia in their adoption of the e-commerce technology.

This finding is also supported by the interview results. Amongst the 16 SMEs who participated in the interview process and who had adopted e-commerce technology, eight of them consider that the innovativeness as a driving factor on the adoption of the e-commerce technology. The followings are some responses given by interviewees regarding to the innovativeness.

*..I always have a desire to make my business more developed. Therefore, if there is a new technology or new innovation or anything that can promote my business, I will take it....*

The owner of company I

*....The e-commerce adoption is just my own desire. Even though I have little experience and knowledge on this, but I believe that I able to do this in my business and I am also ready to face any risk regarding to this technology.*

The owner of company VII

*...I do not have computer science background, but I have an interest in information technology, including internet and computer technology. I really enjoy learning it and I consider myself as self-taught. I also want to grow my business, so I am very happy to try new things that intended to promote my business, including the e-commerce technology.....*

The owner of company XI

*..another factor is my strong desire to follow new technology development, I am a person who like to try new things and I also dare to take a risk related to the new things. ...*

The owner of company XVI

*..the main factor is because I want to bring a better changes for my business. I see a lot of similar companies who have successfully conduct the electronic commerce. Therefore, it is motivated me to do a similar things. I interest on this new technology.....*

The owner of company XVIII

This finding supports previous studies. Wymer and Regan (2005) found innovativeness as a determinant factor that influenced small business in Kentucky, USA in the adoption of e-commerce technology. This factor was also found by Al-Qirim (2007) to play a significant role in adoption of intranet and

web sites by small business in New Zealand. Then, more recent studies, such as Morteza et al. (2011) and Ghobakhloo and Tang (2013) also found a similar result.

As previously explained in Chapter Three, mostly SMEs in general, Indonesian SMEs in particular, are owner-manager businesses; in which the owner, manager or sometimes employees is the same person, and usually any strategic decision is highly dependent on this person, so the character of SMEs owner greatly influences the decisions made. Govindaraju et al. (2012), found that the characteristics of the SMEs owner/managers plays a significant role in decision regarding to e-commerce adoption. A similar result was also found in Scupola (2009) studies, in which the CEO characteristics was found as significant factor that influence Danish and Australian SMEs in their adoption of B2B e-commerce.

Therefore, it is reasonable that the innovativeness of the SMEs owners plays a significant role in adoption of the e-commerce technology. Thong and Yap (1995) revealed that the innovative managers tend to try new things, which is certainly more risky, in solving problems. Like other new innovations, e-commerce technology has two different sides, it provides many potential benefits on one side, and it is certainly has a risk on the other. The decision to adopt is determined particularly by the innovativeness of the business owners/managers. Hence, the more innovative the SMEs owners/managers the more likely he/she has an intention to adopt the e-commerce technology (Ghobakhloo and Tang, 2013). Who also revealed that the speed of the adoption also depends on the innovativeness level.

### 6.3.10 Owners/Managers IT Experience and Ability

Hypothesis 10 and 11: Owners/managers IT experience and ability positively influences the adoption of e-commerce by Indonesian SMEs

Key Finding: The owners/managers IT experience and ability has a positive and significant correlation with the adoption of e-commerce by the Indonesian SMEs.

The owner/managers IT knowledge, in this research, is measured by two measures, which are IT experience and IT ability. The IT experience refers to the extent of the experience of the SMEs owners/managers in using IT in their daily activities, whilst the IT ability refers to the extent of the IT ability of the SMEs owners/managers in regard to certain IT software.

Both measures of this variable show a positive and significant result. The values of the regression coefficient and the significance for IT experience are 0.193 and 0.004, while the values for IT ability are 0.205 and 0.000. These values indicate that both IT experience and IT ability of SMEs owner/manager have a positive and significant correlation with e-commerce adoption. Therefore, it can be concluded that the owner/managers IT experience and IT ability are determinant factors that influence the Indonesian SMEs in adopting of e-commerce technology.

The interview results support this. Twelve of sixteen interviewees consider IT experience and IT ability as determinant factors that influence them in adopting of the e-commerce technology. The following are some of responses given by the interviewees regarding their IT knowledge.

*.....I have sufficient capabilities in information technology because I graduated from computer science. I know about the advantages of the use of IT in business activities, so I am confidence to apply the e-commerce technology in my business.....*

The owner of company IV

*....I am used to using computer since I was in senior high school and I had attended a computer course. In addition, I also have joined the IT training organized by local government. So, I have enough capabilities in computer field. I designed my company websites by myself....*

The owner of company X

*... I did not have computer science background, but I have an interest on information technology, including internet and computer technology. I really enjoy learning it and I consider myself as self-taught...*

The owner of company XI

*.....I was directly involved in the designing and building my company website. I quite know how to manage it, and I do not need specialized IT staff to handle this, because I can do it myself....*

The owner of company XII

*....I graduated from IT and computer sciences, and I have enough knowledge about IT. So I can create, design and manage my company website by myself.....*

The owner of company XIII

*...I build my company website by myself. I learned IT independently. Currently, there have many sites provides guidance in creating company website...*

The owner of company XIV

The interview result indicates that the IT experience and IT ability of SMEs owner/managers can assist the SMEs to overcome their human resources constraints. By having sufficient IT knowledge, the SME owner has higher confidence in adopting IT technology and it will certainly reduce the uncertainty and risk in regard to this adoption. Hence, it is reasonable that the IT knowledge has a positive and significant correlation with the adoption of e-commerce by the SMEs. This result is consistent with Thong and Yap (1995) and Thong (1999). In their study, the IT knowledge of the SME owner was found as a determinant factors that influenced the SMEs in Singapore in their adopting of IT. Then, Kapurubandara and Lawson (2006) reported that one of factors that make SME owners in Sri Lanka reluctant to adopt e-commerce technology is a lack of IT skills.

In Thi and Lim (2011), most of the CEO's characteristics, such as use of computer, IT knowledge, education, gender and age, have a positive and significant correlation with the adoption of e-commerce technology by SMEs in Malaysia. Then, Looi (2005) also found IT knowledge as one of determinant factors that influence SMEs in Brunei Darussalam in their adoption of e-commerce. Moreover, a recent study conducted by Baridam and Nwibere (2015) also confirmed that owner/managers IT experience has a positive and significant correlation with e-commerce adoption by SMEs.

### 6.3.11 SUMMARY

Based on the explanation above, the following table summarises the summary of research findings, related to the second objective, and its analysis and discussion.

**Table 6-1:** Summary of the Finding (related to the second objective) and Its Analysis and Discussion

| Factors that influence Indonesian SMEs in adoption of e-commerce | Finding | Discussion |
|---|---|---|
| Perceived benefits | *Positive and significant*. This is consistent with Alam et al., (2011); Tan et al., (2009); Chong, (2008); Al-Qirim, (2007); Gibbs and Kraemer, (2004); Chwelos et al., (2001); Raymond, (2001); and Poon and Swatman, (1999) study.<br><br>Therefore, this study ***confirmed*** the Innovation Diffusion Theory and also supported the TOE framework. | This finding can be explained by using the behavioural theory. In this theory, it is mentioned that the greater person's belief that the certain behaviour will give a positive impact to themselves, the more likely she/he will do that behaviour. In this regard the greater the owners/managers belief about e-commerce benefits, the more likely they adopt the e-commerce. |
| Compatibility | *Insignificant*. This is inconsistent with Beatty et al. (2001), Tan et al. (2009), Gilaninia et al. (2011), El-Gohary (2012), Grandon and Pearson (2004b), Le et al. (2012) study, however, this result supported the Al-Qirim (2007), Lin and Lin (2008), Ramdani et al. (2009) and Li et al. (2010) study.<br><br>This study challenged the Innovation Diffusion Theory and TOE framework. | The insignificant result could be explained by several reasons. Firstly, it could be because of organizational inertia, in which the SME is more agile and flexible than the large business so that the SME can be more responsive to adapt to the new innovation, including the e-commerce. Secondly, it could be because SMEs do not have so many application in their business so they do not too worry about integrating their existing applications with the new one |
| Cost | *Insignificant*. This result is not consistent with Sila (2013), Alam (2009) and Wymer and Regan (2005) study. However, this result is in accordance with the Al-Qirim (2007) and Morteza (2011) study. | The low level of e-commerce adoption by SMEs in Indonesia could be a reason for this condition, in which most of them are at low level of adoption. So they do not require a sophisticated and an expensive technology devices. In addition the price of computer hardware and sofware have decreased rapidly is also identified as another reason for this condition. |

| | | |
|---|---|---|
| | This study challenged the TOE framework. | |
| Technology Readiness | *Positive and significant.* This result consistent with Gibbs and Kraemer (2004), Zhu et al., (2006), Tiago and Maria (2010), Ramdani et al. (2013), Shah Alam et al. (2011), Le et al. (2012), and Thi and Lim (2011) study.<br><br>Therefore this ***confirmed*** the TOE framework. | It is reasonable because companies that have adequate technology infrastructures, and sufficient IT skills would be more confident to bear the uncertainty regarding IT adoption than those who do not have those competencies |
| Firm Size | *Insignificant*. This is not consistent with Le et al., (2012); Morteza et al. (2011); Chong (2008); Tan et al. (2007); Zhu et al., (2006); and Premkumar and Roberts (1999) study. However, this result consistent with Gibbs and Kraemer (2004), Duan et al. (2012) and Tiago and Maria (2010) study.<br><br>This study challenged the TOE framework | The low level of e-commerce adoption by the Indonesian SMEs is identified as one possible reason for this result. Another reason that could explain this condition is related to the organization inertia, in which once a business passes a threshold of resources, business size does not have relevance anymore. |
| Customers/Supplier pressure | *Insignificant.* This result inconsistent with Le et al. (2012), Li et al. (2010) and Chong (2008) study. However, this supported Al-Qirim (2005; 2007) studies.<br><br>Therefore, this study challenged the TOE framework | One of possible reason for this is because the majority of customers in Indonesia are recognized as "online shopper with conventional manner", so that the SMEs are not compelled to apply a sophisticated technology or extended e-commerce technology |

| | | |
|---|---|---|
| Competitor pressure | *Insignificant.* This result is not consistent with Zhu and Kraemer (2005), Morteza et al. (2011), and Tiago and Maria (2010), however this result supports study finding conducted by Thong and Yap (1995), Thong (1999), Lee (2004), Ramdani et al. (2009), Scupola (2009) and Thi and Lim (2011).<br><br>This result challenged the TOE framework | A possible reason for this condition is because the SMEs being more focused on other technology aspects than their competitive position. In addition to this, it was suggested by Lee (2004) that the decision of SMEs were based on internally important factors. |
| External support | *Positive and significant.* This result consistent with the study conducted by Gibbs and Kraemer (2004), Zhu and Kraemer (2005), Kuan and Chau (2001).<br><br>Therefore, this study confirmed the TOE framework. | It cannot be denied that support from external parties, such as government and IT vendor, could encourage the adoption of e-commerce by SMEs. Support form government, through regulations and policies, can protect the parties involved in the business transaction, in this case the SMEs or the customer; regulate the use of the internet to make it as a secure medium of transactions; and also provide incentives for companies to use e-procurement in their transactions. Then, support from the IT vendor could assist the SMEs to overcome IT skill problems. |
| Owners/managers innovativeness | *Positive and significant.* This study confirmed the study conducted by Wymer and Regan (2005), Al-Qirim (2007), Morteza et al. (2011) and Ghobakhloo and Tang (2013).<br><br>Therefore, this study confirmed the Innovation Diffusion Theory and TOE framework. | The innovative manager prefers to search for a solution that has never been tried before and therefore is more risky. So, the more innovative SMEs owner/manager the more likely he/she has the intention to adopt the e-commerce application. In addition to this |
| Owners/managers IT knowledge | *Positive and significant*. This study consistent with Thong and Yap (1995), Thong (1999), Looi (2005), and Baridam and Nwibere (2015) study. | It can be explained that the manager who has greater knowledge in IS/IT, will be confident in IT adoption and it will reduce the uncertainty and risk in that adoption. In addition to this, the user's skill and knowledge can assist and increase the speed of technology adoption |

## 6.4 THE THIRD OBJECTIVE: TO IDENTIFY BENEFITS REALIZED BY THE INDONESIAN SME IN ADOPTING OF E-COMMERCE

The aim of this section is to discuss those research finding that relate to the benefits realized by the Indonesian SMEs regarding e-commerce adoption. In regard to this, one hypothesis is tested by using the ANOVA test. The hypothesis is:

Hypothesis 12: The higher level of e-commerce adoption by SMEs, the more likely for SMEs to perceive the greater benefits of e-commerce

As presented in the previous chapter, the six benefits of e-commerce with the highest mean scores reported by the Indonesian SMEs are: extending market reach, increased sales, improved external communication, improved company image, improved speed processing, and increased employee's productivity.

The ANOVA test result shows that all of the six benefits, except improved external communication, have a significance value better than 0.05, which means that the SMEs at each level of e-commerce adoption perceived these benefits significantly differently. Therefore, the hypothesis proposed in this study is supported.

This finding is consistent with stage of growth model proposed by Prananto et al. (2003). In this model the benefits of e-commerce gathered by businesses depend on the level of e-commerce adoption, in which the higher level of e-commerce adoption, the more sophisticated technology infrastructures are required, and the greater benefits will be gathered. This finding also supports the finding of Kraemer et al. (2002) study. Based on survey result of 2,139 organization in ten countries (Brazil, China, Denmark, France, Germany, Japan, Mexico, Singapore, Taiwan and the United States), it was shown that mostly the organizations reported the top two highest consequences of the e-commerce adoption on their organization were "widening of the sales area" and "increase in sales". In addition to this, "customer service improvement", "efficiency in internal process", and

"improved coordination with supplier" were also cited by the organizations who participated in this study as other impacts of the e-commerce adoption.

Moreover, in the study conducted Zhu and Kraemer (2005), it was also confirmed that the level of e-business use has a positive and significant correlation with the e-business values gathered by business, in which the higher level of e-business use was associated the higher of e-business value. This condition can be explained by the Resource-Based View. It was mentioned by Zhu and Kraemer (2005), that RBV posits that the greater scope of IT use in organization will lead to a greater possibility for an organization to create rare, inimitable IT capabilities that are scarce, inimitable, valuable and sustainable, thereby contributing to creating and maintaing value. Moreover, the deeper use of IT in an organization will also create asset specificity which provides a competitive advantage (Zhu and Kraemer, 2005).

Table 6-2 table below presents a summary analysis and discussion of the research findings, related to the third objective.

**Table 6-2:** Summary of the Finding (related to the third objective) and Its Analysis and Discussion

| The hypothesis | Finding | Discussion |
|---|---|---|
| The higher the level of e-commerce adoption by SMEs, the more likely for SMEs to perceive the greater benefits of e-commerce. | *Significant*. This result consistent with Prananto et al. (2003), Kraemer et al. (2002), and Zhu and Kraemer (2005) study.<br><br>Therefore, this study ***confirmed*** the RBV theory. | This can be explained by the greater scope of IT use in organization will lead to a greater possibility for an organization to create rare, inimitable IT capabilities that are scarce, inimitable, valuable and sustainable, thereby contributing to create value. Moreover, the deeper use of IT in an organization will also create asset specificity which provides a competitive advantage |

## 6.5 THE FOURTH OBJECTIVE: TO INVESTIGATE THE RELATIONSHIP BETWEEN E-COMMERCE ADOPTION AND SME PERFORMANCE

This section discusses the research finding which relates to the relationship between e-commerce adoption and SME performance. In regard to this, three hypotheses were tested by using the linear regression method. The hypotheses are:

Hypothesis 13a: E-commerce adoption by SMEs has a positive and significant relationship with SMEs performance-market performance

Hypothesis 13b: E-commerce adoption by SMEs has a positive and significant relationship with the SMEs performance-communication performance

Hypothesis 13c: E-commerce adoption by SMEs has a positive and significant relationship with the SMEs performance-cost reduction

The hypotheses result tests are presented separately in the following sub section.

### 6.5.1 E-commerce Adoption and SMEs Market Performance

Key Finding: E-commerce adoption by the SMEs in Indonesia has a positive and significant relationship with the SMEs market performance

The questionnaires were analysed by linear regression and show that the coefficient regression for e-commerce adoption is positive 0.047 and the significance value for this variable is 0.001. These value indicates that e-commerce adoption has positive and significant correlation with market performance.

This result confirmed previous studies results. Kraemer et al. (2002) found that mostly the businesses who participated in their study reported that e-commerce adoption gave a high impact on “widening of the sales area” and increased sales revenue. Then, Wu and Chuang (2010) showed that there was a relationship between adoption of e-SCM to both financial and non-financial business performance. In addition to this, MacGregor and Vrazalic (2006) also found that the e-commerce adoption gave a positive impact on marketing activities.

Two possible explanations explain this condition. Firstly, theoretically and empirically, it is undeniable that the e-commerce provides new ways for SMEs to market their product widely and it is also recognized in literature as a medium for SMEs to enter the global market (Turban, 2010). Therefore, it is reasonable for those SMEs who have adopted it to get these benefits.

Secondly, based on the questionnaire result, it can be seen that majority of SMEs who participated in this study have adopted static websites or interactive websites, in which the website is generally used by them to advertise or market their products. As a result, most of the SMEs who participated in this study perceived that the e-commerce greatly assisted them in expanding their market. This result is also supported by the interview result. Among 16 e-commerce adopters who participated in this study, 13 of them mentioned that their market reach became extended after adopting the e-commerce technology. Then, eight SMEs also revealed that their sales revenues were increased since adopting the e-commerce technology.

The followings are some responses given by the interviewees regarding to the benefits of e-commerce adoption realized by them.

*Our sales are not too much changed after the adoption of e-commerce, as well as the costs……however our market shares are now becoming widespread. People from other areas can see our products.....*

The owner of company I

*…since having a website, our market reach is become wider. Our customers are not only coming from the Solo area, but they are also from other areas, such as Jakarta, Bandung, Surabaya and Jogjakarta…..and our sales are also increasing….*

The owner of company IV

*The main advantage is that we feel that since having a website, our producr have become better known by others from many areas, so that our markets are becoming wider*

The owner of company VI

### 6.5.2 E-commerce Adoption and SME's Communication Performance

Key Finding: E-commerce adoption by SMEs has a positive and significant relationship with the SME's communication performance

The coefficient regression and the significance values for e-commerce adoption from the linear regression are 0.033 and 0.041, which indicate that e-commerce adoption by SMEs in Indonesia has a positive and significant correlation with the SME's communication performance.

This result is consistent with the findings of the Kraemer (2002) study, in which e-commerce adoption had a positive relationship with all types of firm performance. This finding also supports the findings of Molla and Heeks (2007). In that study, the majority of businesses in South Africa perceived the benefits of e-commerce limited to improvements in intra and inter-organizational communication.

It cannot be denied that communication is one important dimension of the e-commerce technology (Xin Xu, Yan, and Zheng, 2008; Molla and Heeks, 2007). The business can improve the reach and richness of the information to be communicated by using e-commerce applications such as e-mail, extranet and intranet (Molla and Heeks, 2007). The reach refers to the number of people that can be contacted with that information, while the richness refers to the quality of information. In traditional commerce, there is a trade-off between the reach and richness; however by using e-commerce technology this trade off can be eliminated. Therefore, it is reasonable that the e-commerce adoption has a positive and significant correlation with communication performance.

The findings from the questionnaire are also supported by the interview results, nine out sixteen interviewees mentioned that the e-commerce allows them to communicate with their customers or suppliers easily and it allows them to get new information easily. Some of the responses regarding to the e-commerce benefits mentioned by the interviewees are presented below.

*.....if I want to find a new supplier or I want to design a new product, then I simply sit in front of the computer and start to search the information that I need,*

*and I will get the information soon. Another advantage is that the e-commerce allows me to communicate with my customers and suppliers easily....*

The owner of company XI

*....Information technology provides easy ways to communicate or seek new business opportunities. Through this technology I can communicate to my customers or my suppliers easily and economically...*

The owner of company XVI

*.....the internet helps me a lot. In order to design my product, firstly I look for information about trend design on Google. Then, I have finished with my design, I will send it to my customers via e-mail....*

The owner of company XVIII

*....it is easier for me to find new customers or new suppliers...*

The owner of company XIX

*...Furthermore, our relationships with suppliers and with customers are also getting better because IT allows us to communicate faster and better...*

The owner of company XXII

### 6.5.3 E-commerce adoption and Cost Reduction

Key Finding: There is no significant relationship between the e-commerce adoption by SMEs in Indonesia with the cost reduction

The questionnaire result analysed by using linear regression shows that the regression coefficient for the e-commerce adoption is positive 0.023, while the significance value for this variable is 0.268. This result reveals that there is no significant relationship between the e-commerce adoptions by the SMEs in Indonesia with their cost reduction.

This result is not consistent with transaction cost theory, in which the use of e-commerce technology in business activity can potentially reduce transaction costs (Molla and Heeks, 2007), which consist of the search cost, contracting cost, monitoring cost, and adaptation cost (Wigand, 1997), by allowing business to communicate with their supplier or customers directly without intermediaries and complicated procedures. However, this result is consistent with the result of Paré (2003). In that study, it was found that the e-commerce application did not contribute toward transaction cost reduction for B2B e-hubs. Then, Humphrey,

Mansell, Paré, and Schmitz (2003) reported that cost reduction, in transportation and logistics, did not occur effectively when adopting e-commerce by businesses in three developing countries. Consistent with this, Molla and Heeks (2007) also found that the use of e-commerce technology by businesses in South Africa was not able to reduce their cost significantly. Two possible explanations are given by Molla and Heeks (2007) regarding this condition. Firstly, it is related with the e-commerce capabilities, in which lower level of capabilities are associated with fewer benefits. Secondly, it was mentioned that the e-commerce adoption in developing countries is still developing and has not yet achieved full tractiont.

These explanations can also be used in respect of the Indonesian condition. As presented in an earlier section, the adoption of e-commerce by the Indonesian SMEs is still low. Overall, less than 15% of SMEs who participated in this study have reached a high level of e-commerce adoption, while the rest are still at the lower level. Compared to the SMEs in developed countries, the SMEs in developing countries are still far behind. This condition is certainly has an impact on the benefits perceived by them, in which the lower level is associated with the fewer benefits and vice versa.

Sixty-four out of the three hundred and one SMEs who participated in this study are at the very basic stage of e-commerce adoption, which only has (and uses) an e-mail. Mostly they use the e-mail to communicate with their customers/suppliers. Then, 100 out 301 SMEs are static website adopters and 74 out 301 SMEs are interactive website adopters. The majority of them use the IT to market their product. Therefore, it is reasonable that they do not really feel any reduction in costs.

In addition to this, based on the questionnaire result, the majority of SMEs (82%) who participated in this study use e-commerce for marketing activities. Only a few of them use it for financial activities or operational and processing activities. As mentioned by previous research, the scope of e-commerce use also has an impact on the benefits perceived by business, in which the wider scope of e-commerce use is more likely to get the greater benefits. Finally, as mentioned by

Molla and Heeks (2007), the e-commerce technology in Indonesia is still developing and it has not achieve full traction yet, so that the benefits gathered by the Indonesian SMEs has yet to be maximized.

## 6.6 CONCLUSION

In this chapter, the findings related to the four research objectives of this study were discussed. The findings of the questionnaire result are integrated and discussed together with the interview result. In regard to the first objective of this research, it is found that the majority SMEs in Indonesia are still at the low level of adopting e-commerce, in which most of them are static and interactive website adopters. On average, e-commerce has been adopted by them for three years or less, and it is mainly used for marketing activities and purchasing and procurement activities.

The second part of this chapter explained the determinant factors of e-commerce adoption by the SMEs in Indonesia. There are six factors found as the influencing factors in adoption of e-commerce by the SMEs in Indonesia, which are: perceived benefits, technology readiness, external support, owners innovativeness, owners IT experience and owners IT ability. While, the other factors, perceived compatibility, cost, firm size, customers/suppliers pressure, and competitive pressure, are found to have no significant relationship with the e-commerce adoption.

This chapter also discusses the benefits of e-commerce realized by the Indonesian SMEs and also the impact of e-commerce adoption on the SMEs performance. Mainly, the benefits of the e-commerce realized by the Indonesian SMEs are the benefits that relate to market reach and communication.

# CHAPTER 7: CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

## 7.0 INTRODUCTION

This main objective of this study is to understand the adoption of e-commerce technology by SMEs in Indonesia, the factors that influence such, and the benefits realized by them in regard to their e-commerce adoption. Based on a review of the extant literature, a comprehensive model of e-commerce adoption was developed. Thirteen hypotheses were developed and tested. Data was collected by a combination of questionnaires and semi-structured interviews. Three hundred and one questionnaires provided quantitative data which was analysed by using regression analysis and ANOVA. The semi-structured interview provided qualitative data about the reasons why these SMEs adopted e-commerce and the actual benefits realized by them, all of which gave useful support to the questionnaire result.

This chapter is divided into seven sections. The first section, section 7.1, summarizes the theory and the study objective, the hypotheses and the study approach chosen. Then, the key findings of this study are highlighted in section 7.2. It is followed by the section 7.3 which summarises implications and recommendations; and in section 7.4, the contributions of this study are presented. In sections 7.5 and 7.6, the limitations of this study and the suggestion for future studies are addressed. Finally, the conclusion to this chapter of this are in section 7.7.

## 7.1 SUMMARY OF THEORY AND HYPOTHESES DEVELOPMENT

As presented previously, the four objectives of this study are:

1. To investigate the extent of the adoption of e-commerce in Indonesian SMEs;
2. To identify factors that influence Indonesian SMEs in adopting e-commerce;
3. To identify benefits gathered by Indonesian SMEs by adopting e-commerce;
4. To investigate the relationship between e-commerce adoption and SME performance

Chapter Two discussed SMEs, their important roles in economic growth; the advantages of e-commerce technology; and also the use of e-commerce technology by SMEs. Chapter Three reviewed six theories concerning e-commerce adoption studies. There have many been theories applied to e-commerce studies. However in this study, the TOE (Technology, Organization and Environment) framework and IDT (Innovation Diffusion Theory) are considered as the most influential theories for the development of the framework of this study. Based on the literature review, thirteen hypotheses were proposed, of which eleven hypotheses are associated with the determinant factors of e-commerce adoption, one hypothesis concerns the benefits of e-commerce and one hypothesis the impact of e-commerce adoption on the SMEs performance. In more detail, the hypotheses developed were:

H1: Perceived benefits positively influence the adoption of e-commerce by SME

H2: Compatibility positively influences the adoption of e-commerce by the SME

H3: Cost negatively influences the adoption of e-commerce by the SME

H4: Technology readiness positively influences the adoption of e-commerce by the SME

H5: Firm size positively influences the adoption of e-commerce by the SME

H6: Customer/supplier pressure positively influences the adoption of e-commerce by the SME

H7: Competitor pressure positively influences the adoption of e-commerce by the SME

H8: External support positively influences the adoption of e-commerce by the SME

H9: Owner/manager innovativeness positively influences the adoption of e-commerce by the SME

H10: Owner/manager IT ability positively influences the adoption of e-commerce by the SME

H11: Owner/manager IT experience positively influences the adoption of e-commerce by the SME

H12: The higher the level of e-commerce adoption by an SME, the more likely that SME will realise greater benefits from e-commerce

H13: (a) E-commerce adoption by an SME will positively influence their market performance

(b) E-commerce adoption by an SME will positively influence the SME's communication performance

(c) E-commerce adoption by an SME positively influence the SME's cost reduction performance

In Chapter Four, the methodology used in this study was explained. Questionnaires and semi-structured interviews were chosen as the ways to collect the data. Then, regression analysis and the ANOVA were used to analyse the data. Research findings were presented, analysed, and disscussed in Chapters Five and Chapter Six.

## 7.2 SUMMARY OF KEY FINDINGS

This section highlights the four key findings of this study, and these were:

### 7.2.1 E-commerce adoption by the Indonesian SMEs

According to the questionnaire result, more than ninety percent percent of the SMEs who participated in this study are e-commerce adopters, while the rest, less than ten percent, are not adopters. Even though the majority of them are e-commerce adopters, however their level of their adoption is still low. The majority of them adopt only a simple website, such as online brochure-ware and online catalogue, or a simple interactive website, and some of them only use e-mail.

Because the majority of SMEs are still at a low level in adopting of e-commerce, it is reasonable to see that at most the majority of SMEs only employ one or two IT staff, whilst many of them (27.85%) do not have any IT staff. In addition, this study also found that majority of the SMEs have adopted e-commerce technology for three years or less. This implies that the adoption of the e-commerce by SMEs in Indonesia is still relatively new.

### 7.2.2 The determinant factors of e-commerce adoption by the SMEs in Indonesia

Eleven factors which were categorized into four categories: technology factors, organizational factors, environmental factors, and individual factors, were proposed in this study as the factors that influence Indonesian SMEs to adopt e-commerce. The technology factors consist of perceived benefits, compatibility, and cost. The organizational factors consist of the technology readiness and firm size. Then the environmental factors consist of customers/suppliers pressure, competitor pressure and external support, while the individual factors consist of the innovativeness, IT experience and IT ability of the owner/ manager

Among the technology factors, only perceived benefits was found to have had a positive and significant correlation with e-commerce adoption, while the others, perceived compatibility and cost, did not have a significant correlation with e-commerce adoption. Regarding the organizational factors, this study found that it was only the perceived compatibility that had a positive and significant correlation with e-commerce adoption, while the firm size was not correlated. Only one variable from environmental factors, which was external support, had a positive and significant correlation with the e-commerce adoption, whilst the others, the customers/suppliers pressure and the competitive pressure, did not.

This study also found that all variables in individual factors, owners innovativeness, owners/managers IT experience and IT ability have a positive and significant relationship with the e-commerce adoption.

### 7.2.3 The benefits realized by the SMEs regarding e-commerce adoption

Extending market reach, increased sales, improved external communication, improve company image, improved speed of processing, and increased employee's productivity are found in this study as the top six benefits realized by SMEs in Indonesia across all of the levels of e-commerce adoption. However the mean scores of these benefits reported by the SMEs tend to increase alongside an increase in the level of e-commerce adoption. An ANOVA test was conducted to investigate whether the scores are significantly differently or not. It showed that all of the six benefits, except improved external communication, have significance values less than 0.05. and so indicating that those SMEs with the higher level of e-commerce adoption tended to realize greater benefits of e-commerce compared to the others.

### 7.2.4 The Impact of e-commerce adoption on the SMEs performance

The impact of e-commerce adoption on SME performance was also investigated in this study. Three measures were used to measure this performance, which are market performance, communication and cost reduction. Based on regression analysis, it was found in this study that e-commerce adoption only has a positive and significant correlation with the two of the three performance measures, namely: market performance and communication performance.

## 7.3 IMPLICATION AND RECOMMENDATIONS

These key findings have implications for the Indonesian government, IT vendors, and the SME owners.

### 7.3.1 Implication and Recommendation for Indonesian Government

As described in Chapter Two, the Indonesian government has made a lot of effort to encourage SMEs in their adopting of e-commerce in order to develop their business, however, according to this study it is shown that the adoption of e-commerce by SMEs in Indonesia is still low compared with the adoption of e-commerce by SMEs in developed countries. This condition certainly has implications for the government to further increase their efforts through

promoting effective programmes and initiatives to encourage the adoption of e-commerce by Indonesian SMEs.

Perceived benefit, technology readiness, external support, owner/manager innovativeness, and owner/managerIT experience and IT ability are found in this study as determinant factors that influence SMEs in Indonesian to adopt e-commerce. This finding has several implications. For the Indonesian government, in regard to their efforts in encouraging SMEs in their adopting of e-commerce technology, the government should give particular attention to the owners of the SME. This is because the owners of SMEs have great influence in their business. It is often found that the SME in Indonesia is the owner-manager firm, in which manager; owner; or employee is the same person, and decisions in SMEs are highly influenced by the owners. Therefore, the programmes and initiatives undertaken by Indonesian government to develop SMEs must engage SME owners. To encourage the adoption of e-commerce technology in SMEs in Indonesia, the government's first priority must be to provide an insight to SME owner/manager about the potential marketing and commercial benefits offered by e-commerce technology. By increasing their understanding about these potential benefits, it is expected that their likelihood to adopt e-commerce technology will increase. Technical and system considerations and training can follow later.

Having provided insight, the government should only then provide IT training for the SME owner/managers, so that the SMEs owners have at least a basic knowledge of IT. Having sufficient IT knowledge would not only increase the confidence level of the SME owners/managers regarding e-commerce adoption and but also importantly reduce the level of uncertainty related to e-commerce adoption. Thus their likelihood to adopt this technology would increase.

Turning to the consideration of technology both internally to the SME and externally in the country, then, this study indicates that technology readiness does, and must, play an important role in adoption of e-commerce by Indonesian SMEs. Technology readiness refers to the extent that the external technology infrastructure and internally the relevant systems and IT human resources that are

available to the SME can support the adoption of e-commerce. Besides IT skills, the availability of sufficient technology infrastructure in SMEs is also an important consideration both for SME owners and the Indonesian government when it comes to SME development. It cannot be denied that the lack of technology infrastructure is one of the barriers for SMEs in many countries, especially in developing countries including Indonesia, in adopting e-commerce. The lack of technology infrastructures are not only associated with the lack of technology hardware, but it also related to the lack of availability of adequate telecommunication networks, the poor, or non existent, availability of an inexpensive network and the lack of information security. Therefore, it is recommended that the Indonesian government give their support to solve these problems by enhancing the quality of telecommunication services; such as internet broadband, and providing cheap information networks for small business, and enhancing the quality of internet security. Such support could be expected to increase the intention of SME owners to adopt e-commerce technology.

Finally, as found in this study, since external support, including government support, has a positive correlation with e-commerce adoption, then government support at the different levels discussed are really needed by SMEs to encourage them to adopt e-commerce.

### 7.3.2 Implication and Recommendation for IT Vendor/Consultant

The findings of this study also have an implication for IT vendors responsible for promoting e-commerce adoption to the SMEs. The low level of e-commerce adoption by SMEs in Indonesia would be an opportunity for IT vendors to promote their products and services. In order to increase their chance of success, it is recommended that they address their product and services to the innovative SME owners. The innovative owners can be characterized with their tendency to solve problems in unusual ways and so accepting more risk. The more innovative the SME owners/managers, the more likely that he/she has an intention to adopt the e-commerce technology (Ghobakhloo and Tang, 2013). In addition to this, the IT vendors are also advised to actively give information about the potential

benefits of e-commerce to their client and provide assistance during, and after if needed, the implementation process. According to the study findings, the external support, including IT vendor support, is found as one of the determinant factors that influence the SMEs in Indonesia in adopting of e-commerce.

### 7.3.3 Implication and Recommendation for the SMEs owners

This study has implication for the SMEs owners, especially regarding the importance of understanding e-commerce technology for SME owners. As described previously, e-commerce technology has changed many things in businesses, it changes not only the way companies do their business, but it also changes their business perspective and it certainly brings major changes in the world economy. Hence to survive in the global economy, businesses, and SMEs particularly, are pushed to adopt this technology. For those who do not adopt it, they will be left behind by those who do adopt it. However, to be able to adopt it effectively, three things must be considered by SMEs. The first being that e-commerce technology is not a single or simple innovation that can simply just be adopted or not adopted, adoption comes in various degrees of complexity and sophistication depending on business needs and resources. So it is important for the SME owner to have enough knowledge about the development of e-commerce adoption in an organization in order to create an effective business strategy. By knowing about the possible stages of e-commerce adoption, SME owners will be assisted in evaluating their current stage and then making a decision whether to move forward to the next stage or not. This will also be useful for SME owners to make appropriate planning to face their upcoming stages. The greater understanding about this will certainly reduce the uncertainty of e-commerce adoption.

Then, an adequate understanding about the potential benefits of e-commerce should also be had by the SME owners. A greater understanding by owners about the potential benefits will increase their probability to allocate some resources towards adopting e-commerce (Tiago and Maria, 2010; Iacovou et al., 1995). As presented earlier, extending their market reach, increased sales, improvements in:

external communication, company image, speed of data processing, and employee productivity were the top six benefits in adopting e-commerce that were reported by Indonesian SMEs, and this study has shown that the higher the level of e-commerce adoption, the greater benefits will be gained. This condition certainly can be a consideration for SME owners in adopting e-commerce and this also will be useful for SME owner in deciding whether to move forward to the next stage or not. In addition, it was also found that the adoption of e-commerce has a positive and significant impact on the SME's performance. The implication of these findings for the SMEs owners should encourage them to further optimize the utilization of e-commerce in their business and to realise that they should increase their level of adoption in order to get maximum benefits.

Then, the SMEs owners should also be aware that their IT knowledge has an affect on the degree of the uncertainty percieved in adopting e-commerce, where a greater knowledge of IT will increase their confidence in adopting of e-commerce as this can reduce the level of uncertainty and risk associated with the adoption of e-commerce.

Moreover, the availibility of sufficient technology infrastructure and IT skills must also be taken into consideration for the SME owners in adopting e-commerce. It is recognized that these can increase the level of confidence in adopting the technology.

## 7.4 CONTRIBUTION OF THIS STUDY

Based on the findings presented in Chapter Five, the key findings and the implication and recommendation above, there are seven contributions made by this study. Three are contributions to theory and four are contribution to practice.

### 7.4.1 Contributions to theory

(1) The main contribution to theory of this study is that it adds value to the technology diffusion literature, especially the e-commerce literature. This study provides a holistic picture about the adoption of e-commerce by SMEs in Indonesia particularly and SMEs in developing countries generally. In

this regard, this study is not only focussed on the factors that influence small business in adopting of e-commerce but it is also aimed at understanding post adoption benefits. The development of a model that consists of both the influencing factors of e-commerce adoption and its post adoption benefits, (downstream and upstream) provides a wider understanding about the adoption of e-commerce in the SMEs. It is hoped that this model can be used as a basis for further theoretical framework and empirical studies.

(2) This study also contibutes in regard to the use of a multistage measure instead of a dichotomous measure to measure e-commerce adoption. As decribed previously, the dichotomous measure that has been commonly used in previous studies is unable to capture the breath and richness of the adoption of e-commerce technology (Gibbs and Kraemer, 2004). Therefore, the use of a multistage measure as with this study can eliminate the weaknesses of the dichotomous measure.

(3) Because this study utilises and combines both the TOE framework and the Diffusion of Innovation theory, the resulting model takes account of not only technological, environmental and organizational factors but also individual factors as the determinant factors of e-commerce adoption. One interesting finding of this study is that all variables concerning individual factors played a significant role in the adopting of e-commerce by the SMEs. Many previous studies just paid attention to the technological or organizational factors, and only a few of studies focused on individual characteristics. This finding is expected to provide value to the technology diffusion literature, especially on the technology diffusion in the SMEs in developing countries, by considering the individual characteristics as the determinant factors that influence SMEs in developing countries in adopting of e-commerce technology.

### 7.4.2 Contributions to practice

(1) This study provides a comprehensive picture about e-commerce adoption by SMEs in Indonesia. This comprehensive picture certainly give a better

understanding for the SMEs owner/managers and it is useful for them to make a decision related to the use of e-commerce in their business. For example, by knowing the benefits of e-commerce and its impact on the SME performance, SME owners will be encouraged to further improve the level of their adoption.

(2) The comprehensive picture about e-commerce adoption by these Indonesian SMEs is also useful for the Indonesian government in making policies related to the development of SMEs. For example, this study provides insight into the extent of e-commerce adoption by SMEs in Indonesia. This information is useful for the Indonesian government in mapping the level of e-commerce usage, so that it will be easier for them to make effective programmes and initiatives tailored to SMEs needs.

(3) In addition to this, academics and practitioners also can understand the factors that facilitate and hinder SMEs in adopting e-commerce. This study provides empirical support about the important role of individual factors in adopting of e-commerce by the SMEs in Indonesia.

(4) Due to a lack of studies conducted into SMEs in developing countries, especially in Indonesia, this study brings a new, possibly fresher and more comprehensive perspective on the adoption of e-commerce by SMEs.

## 7.5 LIMITATIONS OF THE STUDY

Even though this study provides a comprehensive understanding about the e-commerce adoption by SMEs in Indonesia, this study has a number of limitations.

(1) This study is a cross sectional study, and so limited to a single point of time. As a strategic decision, the decision-making processes related to e-commerce adoption by SMEs might develop over time but because of the inherent time constraint of the cross sectional study, these longitudinal perspective were not investigated. Future studies might then consider the extent to which cross sectional data needs to be supplemented by longtitudinal data, which in itself would need some further consideration

about the time period over which decisions about e-commerce adoption are made. However, the majority (72.14%) of SMEs in the study had only recently adopted e-commerce (less than three years). To be able to capture the longitudinal perspective and investigate the causality of the influencing factors and the SMEs decisions, a future study might need to consider the appropriateness of a longitudinal study. Unless the researcher would rely upon recall by participants, this suggests setting up a longitudinal database now to map how SMEs make decisions about e-commerce adoption.

(2) One of data collection methods used in this study was an on-line questionnaire. This method has several drawbacks, one of which is associated with a risk that the questionnaire is not completed by the right person (as desired by the researcher). This was minimized by sending the questionnaires directly to the SMEs owners via their personal e-mail. Even though there is the possibility it is not completed by the right person, however the researcher has to acknowledge the completed questionnaire in good faith. Besides using the on-line questionnaire, a semi-structured telephone interview was also used in this study. Several weaknesses have been identified by several authors regarding to this method. For instance, for those who do not have a telephone certainly cannot be interviewed; for those who have hearing impairments there is an obvious problem; the researcher cannot see a sign given by individual face or body language of respondent; and sometimes it is not easy to ask respondents sensitive questions through telephone. Even though this method has several weaknesses, this study still used this method. The main reason was because the geography of Indonesia means that SMEs are widely scattered so there are both time and cost constraints to doing face to face interviews. The sample frame was chosen to cover a wide geographical spread of SMEs and not just to focus on selected connurbations. However in many respects the telephone interview can be considered as less subjective because the interviewer cannot see respondents' appearance, social class or even ethnicity.

(3) The use of single person as the informant could certainly lead to single-informant bias, in which the single person may not be able to reflect a perspective of the whole organization. However, due to the fact that the SMEs are less complex than large companies, and it is often found that the SME in Indonesia are owner-manager business, in which the managers, the owner or even the employee is the same person, that bias should not be a serious issue in this study.

(4) Since data used in this study is data from SMEs in Indonesia, then it limits the generalizability of this study to an Indonesian-SME based study. Even so, this study is expected to be useful as a basis for developing of a theoretical framework for the adoption of e-commerce in other developing countries.

## 7.6 FUTURE RESEARCH DIRECTION

Two opportunities for further work are available:

(1) As mentioned in limitation section, this cross sectional study only focused on one single point of time. Whilst it is a legitimate approach to investigate a single point in a decision event, it might be interesting to not only investigate the point of actual action – when the decision is made but also the antecedent factors that lead up to that tipping point .

(2) Based on the interview result, it was found that some of the SMEs in Indonesia had adopted e-commerce but that they had stopped using it several years ago. Further study could focus on this issue of whether lapsed adopters would, for example ever become re-adopters.

## 7.7 CHAPTER CONCLUSIONS

This study provides a comprehensive understanding about the e-commerce adoption by SMEs in Indonesia. This study is not only focused on the downstream issues, that are related to the factors that influence SMEs in Indonesia in adopting e-commerce, but it also explored upstream issues, which relate to the post adoption benefits.

This study contributes to theory and practice, and it also provides both implications and recommendations for several parties including the Indonesian government, IT vendors and SME owners, in order to enhance the use of e-commerce technology in business, particularly in SMEs.

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**APPENDIX**

**Part one. General information**

1. Firm Name : ……
2. Address :…….
3. E-mail address :……
   ……
4. Telephone number:……..

5. Industry Type:
   a. Agriculture
   b. Mining
   c. Manufacture
   d. Electronic, gas and water supply
   e. Construction
   f. Trade, hotel and restaurant
   g. Transport & communication
   h. Finance, rent & service

6. Total assets (Land and building are not included):
   a. 0 ≤ Rp. 50.000.000,-
   b. Rp. 50.000.000, - < Rp. 500.000.000,-
   c. Rp. 500.000.000,- < Rp. 10.000.000.000,-
   d. ≥ Rp. 10.000.000.000,-

7. The number of employees:
   a. < 5 people
   b. 5-9 people
   c. 20-99 people
   d. >100 people

8. Sales per year:
   a. < Rp. 300.000.000,-
   b. Rp. 300.000.000,- < Rp. 2.500.000.000,-
   c. Rp. 2.500.000.000,- < Rp. 50.000.000.000,-
   d. ≥ Rp. 50.000.000.000,-

**Part two. The Current Condition of E-Commerce Status**

9. Which one best describes your current e-commerce status
   a. Not connected to the internet, no e –mail and no intention to adopt
   b. Not connected to the internet, no-email but I have intention to adopt
   c. Connected to the internet with e –mail but no web site
   d. Static e-commerce, that is publishing basic company information on the web without any interactivity
   e. Interactive e-commerce, that is accepting queries, e-mail; and form entry from users
   f. Transactive e-commerce, that is online selling and purchasing of products and services including customer service

g. Integrated e-commerce, which is the web site, is integrated with suppliers, customers and other back office systems allowing most of the business transactions to be conducted electronically.
h. Web 2.0 technologies such as blog, twitter, Facebook and other social networked

How long you are in this condition
a. 1 year
b. 2 to 3 years
c. 4-5 years
d. More than 6 years

10. Which one best describes your future e-commerce status
a. Not connected to the internet, no e –mail and no intention to adopt
b. Not connected to the internet, no-email but I have intention to adopt
c. Connected to the internet with e –mail but no web site
d. Static e-commerce, that is publishing basic company information on the web without any interactivity
e. Interactive e-commerce, that is accepting queries, e-mail; and form entry from users
f. Transactive e-commerce, that is online selling and purchasing of products and services including customer service
g. Integrated e-commerce, which is the web site, is integrated with suppliers, customers and other back office systems allowing most of the business transactions to be conducted electronically.
h. Web 2.0 technologies such as blog, twitter, Facebook and other social networked

How long you are in this condition
a. 1 year
b. 2 to 3 years
c. 4-5 years
d. More than 6 years

11. In what kind activities do you use internet technology:
a. logistics and delivery
b. finance
c. purchasing and procurement (including management of infrastructure and support services)
d. operations, processing and assembly (including research and development of products/services)
e. marketing and sales
f. after sales services

12. How many IT staff that you have:
a. None
b. 1-2 people
c. 3-5 people
d. More than 5 people

**Part three. The influence factors**

On the scale of 1 (strongly disagree) to 5(strongly agree), indicate your level of agreement with the following statement:

1 Strongly agree
2 Agree
3 Neutral
4 Disagree
5 Strongly disagree

| No | Statement | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 13 | ***Perceived benefits*** | | | | | |
| | a. E-commerce provides new opportunities | | | | | |
| | b. E-commerce allow us to accomplish specific task more quickly | | | | | |
| | c. E-commerce allow us enhance our productivity | | | | | |
| | d. E-commerce allows us to save time in searching for resources | | | | | |
| | e. E-commerce allows us to improve our job performance | | | | | |
| | f. E-commerce allows us to purchase product and services for the business | | | | | |
| | g. E-commerce allows us to learn more about competitors | | | | | |
| | h. E-commerce allows for better advertising and marketing | | | | | |
| | i. E-commerce provides timely information for decision making purposes | | | | | |
| | j. E-commerce increase our profitability | | | | | |
| 14 | ***Perceived compatibility*** | | | | | |
| | a. E-commerce compatible with our culture and values | | | | | |
| | b. E-commerce compatible with our preferred work practice | | | | | |
| | c. E-commerce created changes are compatible with our business | | | | | |
| | d. E-commerce security is not compatible with us | | | | | |
| | e. E-commerce legal issue are not compatible with us | | | | | |
| | f. E-commerce is compatible with our customers | | | | | |
| | g. E-commerce not compatible with our IT infrastructure | | | | | |
| 15 | ***Cost*** | | | | | |
| | a. The cost of EC is high for our company | | | | | |
| | b. The amount of money and time training for E-commerce company is high for our company | | | | | |
| | c. The maintenance and support fees for E-commerce applications are high for our company | | | | | |
| | d. The amount of services provider fees are high for our company | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 16 | ***Technology readiness*** | | | | | |
| | a. Our organization have sufficient experience with network based application | | | | | |
| | b. Our organization have sufficient business resources to implement e-commerce | | | | | |
| | c. Our organization is well computerized with LAN and WAN | | | | | |
| | d. Our organization have high bandwidth connectivity to the internet | | | | | |
| | e. Our existing system are flexible | | | | | |
| | f. Our existing system are customizable to our customers need | | | | | |
| 17 | ***Customer/ supplier Pressure*** | | | | | |
| | a. Our industries pressuring us to adopt e-commerce | | | | | |
| | b. Our customer and buyer are pressuring us to adopt e-commerce | | | | | |
| | c. Our suppler are pressuring us to adopt e-commerce | | | | | |
| | d. Our distant partner demands for better communication and data interchange are pressuring us to adopt e-commerce | | | | | |
| 18 | ***Competitor pressure*** | | | | | |
| | a. The rivalry among companies in the industry of my company is operating in very intense | | | | | |
| | b. It's easy for our customers to switch to another company for similar services/product without much difficulty | | | | | |
| | c. Our customer are able to easily access in several existing products/services n the market which are different from ours but perform the same function | | | | | |
| 19 | ***Government support*** | | | | | |
| | a. The government provides IT training/assistance | | | | | |
| | b. The government requires to use internet technologies related to funding | | | | | |
| 20 | ***Support from technology vendor*** | | | | | |
| | a. Vendor actively market E-commerce | | | | | |
| | b. There are adequate technical support for esc provided by vendors | | | | | |
| | c. Training for E-commerce is adequately provided by vendor | | | | | |
| 21 | ***CEO's Innovativeness*** | | | | | |
| | a. I have original idea | | | | | |
| | b. I would sooner create something new than improve something existing | | | | | |
| | c. I often risk doing things differently | | | | | |
| | d. I often have fresh perspective on old problem | | | | | |
| 22 | ***CEO's Involvement*** | | | | | |
| | a. CEO involved in adoption | | | | | |
| | b. CEO involved in implementation | | | | | |
| | c. CEO leads change | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 23 | ***CEO's Knowledge*** | | | | | |
| | a. I attended computer classes/training | | | | | |
| | b. I use a computer at home | | | | | |
| | c. I use a computer at work | | | | | |
| | d. I Have formal qualification in the use and operation of computer | | | | | |
| | e. I would rate my own understanding of computers (before my company computerized ) as very good compared to other people in similar positions | | | | | |

24. Please circle one option only to indicate your actual experience with computer and information system

1 no experience
2 little experience
3 average experience
4 good experiences
5 excellent experiences

| | | | | | |
|---|---|---|---|---|---|
| Using operating systems such as Microsoft windows, Linux, Unix, Ubuntu … | 1 | 2 | 3 | 4 | 5 |
| Using computer packages such as spreadsheet, word processing or database | 1 | 2 | 3 | 4 | 5 |
| Building visual models on computers such as financial, statistical or graphical | 1 | 2 | 3 | 4 | 5 |
| Using internet and www to communicate and interchange data | 1 | 2 | 3 | 4 | 5 |

**Part four. The benefits of e-commerce**

25. Choose the benefits that you have gained since you applied e-commerce, and indicate the level of agreement in each benefit:

1 Strongly agree
2 Agree
3 Neutral
4 Disagree
5 Strongly disagree

| | **Benefit** | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| a. | Increased revenue | | | | | |
| b. | Reduced operation cost | | | | | |
| c. | Reduced cost of purchasing and procurement | | | | | |
| d. | reduced marketing costs | | | | | |
| e. | increased customer loyalty and retention | | | | | |
| f. | Reduced complain from client | | | | | |
| g. | improved supplier relationship | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| h. | improved competitive position | | | | | |
| i. | extending market reach | | | | | |
| j. | improved speed of processing | | | | | |
| k. | improved external communication | | | | | |
| l. | improved company image | | | | | |
| m. | improved internal communication | | | | | |
| n. | Increased employee's satisfaction | | | | | |
| o. | Increased employee's productivity | | | | | |

**Part four. Demographic Factor**

26. Respondent name :…….

27. Gender : …….

28. Age :……

29. Education :……

30. Position :…….

**Bagian 1: Informasi Umum**

Bagian satu ini berisi informasi umum tentang perusahaan anda. Seluruh data yang anda isikan hanya akan digunakan untuk tujuan penelitian, dan akan dijaga kerahasiaannya.

1. Nama Perusahaan : ……
2. Alamat perusahaan : ……
   ……
   ……
3. Alamat e-mail : ……
4. Nomor telepon : ……
5. Tipe industry :
   a. Pertanian
   b. Pertambangan
   c. Pabrik
   d. Penyedia listrik, gas atau air
   e. Jasa konstruksi
   f. Perdagangan, hotel atau restoran
   g. Perusahaan transportasi, komunikasi
   h. Perusahaan jasa keuangan, penyewaan atau jasa lainnya
6. Total asset (tidak termasuk tanah dan bangunan) :
   a. 0 sampai dengan 50 juta rupiah
   b. 50 juta sampai dengan 500 juta rupiah
   c. 500 juta sampai dengan 10 milyar rupiah
   d. Besar dari 10 milyar rupiah
7. Jumlah pegawai/pekerja
   a. kurang dari 5 orang
   b. 5 sampai dengan 19 orang
   c. 20 sampai dengan 99 orang
   d. Besar dari 100 orang
8. Total penjualan per tahun
   a. dibawah 300 juta rupiah per tahun
   b. Antara 300 juta sampai dengan 2,5 milyar per tahun
   c. Antara 2,5 milyar sampai dengan 50 milyar per tahun
   d. Besar dari 50 milyar per tahun

**Bagian 2. Kondisi penggunaan teknologi Informasi/internet saat ini**

9. Berikut ini adalah beberapa kemungkinan kondisi penggunaan teknologi informasi di perusahaan Bapak/Ibu, pilihlah salah satu kondisi yang paling sesuai yang mencerminkan penggunaan teknologi informasi/internet pada perusahaan Bapak/Ibu **sekarang**:
   a. Perusahaan Bapak/Ibu tidak terhubung dengan internet, tidak memiliki/menggunakan e-mail dalam aktivitas bisnis *dan tidak memiliki keinginan untuk memiliki atau menggunakan teknologi informasi tersebut*.
   b. Perusahaan Bapak/Ibu tidak terhubung dengan internet, tidak memiliki/menggunakan e-mail dalam aktivitas bisnis *tapi memiliki keinginan untuk memiliki atau menggunakan teknologi informasi tersebut*
   c. Memiliki web site yang hanya bisa menampilkan informasi umum perusahaan serta produk dan jasa yang ditawarkan, tanpa ada interaksi dengan pelanggan atau supplier.

d. Memiliki website yang memungkinkan pelanggan/calon pelanggan ataupun pihak luar lainnya melakukan pemesanan barang, tapi tidak bisa melakukan pembayaran secara on line.
e. Memiliki website yang memungkinkan pelanggan/calon pelanggan ataupun pihak luar lainnya melakukan pemesanan barang dan juga bisa melakukan pembayaran secara on line.
f. Memiliki website yang terhubung dengan sistem di dalam perusahaan, seperti sistem pencatatan persediaan, sistem informasi akuntansi dan sistem lainnya secara terintegrasi
g. Memiliki website yang terintegrasi dengan sistem baik yang di dalam perusahaan ataupun di perusahaan supplier atau perusahaan pelanggan.
h. Memiliki blog, facebook, twitter, linkeldn atau media social lainnya

Sejak berapa lama perusahaan Bapak/Ibu dalam kondisi ini

a. Kurang dari satu tahun
b. 2 atau 3 tahun
c. 4 atau 5 tahun
d. Lebih dari 6 tahun

10. Berikut ini adalah beberapa kemungkinan kondisi penggunaan teknologi informasi di perusahaan Bapak/Ibu, pilihlah salah satu kondisi yang paling sesuai yang mencerminkan penggunaan teknologi informasi/internet pada perusahaan Bapak/Ibu **dimasa yang akan datang**.
    a. Perusahaan Bapak/Ibu tidak terhubung dengan internet, tidak memiliki/menggunakan e-mail dalam aktivitas bisnis *dan tidak memiliki keinginan untuk memiliki atau menggunakan teknologi informasi tersebut*.
    b. Perusahaan Bapak/Ibu tidak terhubung dengan internet, tidak memiliki/menggunakan e-mail dalam aktivitas bisnis *tapi memiliki keinginan untuk memiliki atau menggunakan teknologi informasi tersebut*
    c. Memiliki web site yang hanya bisa menampilkan informasi umum perusahaan serta produk dan jasa yang ditawarkan, tanpa ada interaksi dengan pelanggan atau supplier.
    d. Memiliki website yang memungkinkan pelanggan/calon pelanggan ataupun pihak luar lainnya melakukan pemesanan barang, tapi tidak bisa melakukan pembayaran secara on line.
    e. Memiliki website yang memungkinkan pelanggan/calon pelanggan ataupun pihak luar lainnya melakukan pemesanan barang dan juga bisa melakukan pembayaran secara on line.
    f. Memiliki website yang terhubung dengan sistem di dalam perusahaan, seperti sistem pencatatan persediaan, sistem informasi akuntansi dan sistem lainnya secara terintegrasi
    g. Memiliki website yang terintegrasi dengan sistem baik yang di dalam perusahaan ataupun di perusahaan supplier atau perusahaan pelanggan.
    h. Memiliki blog, facebook, twitter, linkeldn atau media social lainnya

    Kapankah rencana sesuai kondisi diatas (pertanyaan no 3) akan terwujud

    a. Kurang dari satu tahun
    b. 2 atau 3 tahun
    c. 4 atau 5 tahun

d. Lebih dari 6 tahun

11. Dalam aktivitas apa sajakah perusahaan Bapak/Ibu menggunakan teknologi informasi atau teknologi internet ini?
    a. Logistik dan pengiriman barang
    b. Aktivitas keuangan
    c. Aktivitas pembelian dan pengadaan barang
    d. Aktivitas operasional, pemprosesan barang dan perakitan
    e. Marketing dan penjualan
    f. Layanan purna jual/after sales services
12. Barapakah jumlah karyawan yang terkait dengan penggunaan teknologi informasi/internet ini?
    a. Tidak ada
    b. 1-2 orang
    c. 3-5 orang
    d. lebih dari 5 orang

**Bagian 3. Factor-faktor yang mempengaruhi penggunaan/adopsi teknologi informasi**

Dibawah ini terdapat beberapa pernyataan yang terkait dengan penggunaan teknologi informasi atau perdagangan elektronik pada perusahaan Bapak/Ibu. Nyatakanlah pendapat anda dengan skala 1 sampai 5, dimana

1 menunjukkan sikap sangat setuju
2 menunjukkan sikap setuju
3 menunjukkan sikap netral
4 menunjukkan sikap tidak setuju
5 menunjukkan sikap sangat tidak setuju

| No | Pernyataan | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 13 | Manfaat apa yang dirasakan dari perdagangan secara elektronik (e-commerce)? : | | | | | |
| | a. menyediakan peluang baru bagi perusahaan | | | | | |
| | b. menyelesaikan pekerjaan tertentu secara lebih cepat | | | | | |
| | c. meningkatkan produktivitas perusahaan | | | | | |
| | d. menghemat waktu dalam mencari sumber daya | | | | | |
| | e. meningkatkan kinerja pekerjaan anda | | | | | |
| | f. memungkinkan kita menjual produk dan jasa kepada pelanggan secara luas | | | | | |
| | g. memungkinkan kita untuk mengetahui keadaan perusahaan pesaing | | | | | |
| | h. memasarkan dan mengiklankan produk secara lebih baik | | | | | |
| | i. menghasilkan informasi yang tepat waktu untuk pengambilan keputusan | | | | | |
| | j. Meningkatkan keuntungan perusahaan | | | | | |
| 14 | Tingkat kesusuaian yang dirasakan dalam penggunaan teknologi informasi atau perdagangan secara elektronik | | | | | |
| | a. e-commerce sangat sesuai dengan budaya dan nilai perusahaan kami | | | | | |
| | b. e-commerce sangat sesuai dengan praktek kerja di perusahaan kami | | | | | |
| | c. e-commerce menciptakan beberapa perubahan yang sesuai | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | dengan aktivitas bisnis peusahaan kami | | | | | |
| | d. Tingkat pengamanan/security perdagangan secara elektronik (e-commerce)tidak sesuai dengan perusahaan kami | | | | | |
| | e. masalah legalitas perdagangan secara elektronik (e-commerce) tidak sesuai dengan perusahaan kami | | | | | |
| | f. perdagangan secara elektronik (e-commerce) sesuai dengan pelanggan kami | | | | | |
| | g. perdagangan secara elektronik (e-commerce) tidak sesuai dengan infrastruktur teknologi informasi di perusahaan kami | | | | | |
| 15 | Faktor biaya yang terkait dengan penggunaan perdagangan secara elektronik (e-commerce) | | | | | |
| | a. biaya penggunaan e-commerce terasa sangat tinggi bagi perusahaan kami | | | | | |
| | b. waktu yang dibutuhkan untuk pelatihan e-commerce dan/atau biaya pelatihan terasa cukup memberatkan bagi perusahaan kami | | | | | |
| | c. biaya pemeliharaan dan biaya pendukung lainnya terasa sangat tinggi bagi perusahaan kami | | | | | |
| | d. biaya yang dikeluarkan untuk penyedia layanan internet (service provider) terasa cukup tinggi bagi perusahaan kami | | | | | |
| 16 | Kesiapan teknologi di perusahaan anda | | | | | |
| | a. Perusahaan kami memiliki pengalaman yang cukup terkait dengan aplikasi yang berbasis jaringan (network) | | | | | |
| | b. perusahaan kami memiliki sumber daya yang cukup untuk mengimplementasikan e-commerce | | | | | |
| | c. perusahaan kami terkomputerisasi dengan baik dengan jaringan LAN (local area network) atau WAN (wide area network) | | | | | |
| | d. perusahaan kami memiliki koneksi internet dengan bandwith yang cukup tinggi | | | | | |
| | e. sistem yang ada di perusahaan kami saat ini adalah fleksibel | | | | | |
| | f. sistem yang ada di perusahaan kami saat ini disesuaikan dengan kebutuhan pelanggan | | | | | |
| 17 | Tekanan dari pelanggan ataupun pemasok dalam penggunaan perdagangan secara elektronik (e-commerce) | | | | | |
| | a. terdapat tekanan dari industri untuk mengadopsi e-commerce | | | | | |
| | b. terdapat tekanan dari pelanggan dan pembeli untuk mengadopsi e-commere | | | | | |
| | c. terdapat tekanan dari pemasok untuk mengadopsi e-commerce | | | | | |
| | d. rekan bisnis yang berada dilokasi yang cukup jauh meminta kami untuk mengadopsi e-commerce untuk memudahkan komunikasi dan pertukaran data | | | | | |
| 18 | Tekanan dari kompetitor terkait dengan penggunaan perdagangan secara elektronik (e-commerce) | | | | | |
| | a. tingkat persaingan diantara perusahaan-perusahaan yang berada dalam industri ini adalah sangat tinggi | | | | | |
| | b. sangat mudah bagi pelanggan perusahaan ini untuk berpindah pada perusahaan lain yang menawarkan produk/jasa yang sejenis | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | c. Pelanggan perusahaan kami sangat mudah mengakses bermacam-macam produk/jasa yang desainnya berbeda dengan produk dari perusahaan kami tapi memiliki fungsi yang sama dengan produk kami | | | | | |
| 19 | Tekanan dari pemerintah terkait dengan penggunaan perdagangan secara elektronik (e-commerce) | | | | | |
| | a. Adanya anjuran/ajakan/tekanan dari pemerintah untuk menggunakan e-commerce | | | | | |
| | b. Pemerintah mensyaratkan untuk menggunakan teknologi internet terkait dengan pemberian bantuan atau keringanan lainnya | | | | | |
| 20 | Dukungan dari penyedia teknologi (technology vendor) | | | | | |
| | a. Penyedia teknologi (vendor) secara aktif memperkenalkan e-commerce | | | | | |
| | b. terdapat dukungan teknik yang cukup untuk penggunaan e-commerce dari penyedia teknologi (vendor) | | | | | |
| | c. pelatihan e-commerce yang memadai disediakan oleh penyedia teknologi (vendor) | | | | | |
| 21 | Inovasi dari Pemilik/Pimpinan perusahaan | | | | | |
| | a. Saya (pimpinan saya) memiliki ide yang orisinil | | | | | |
| | b. Saya (pimpinan saya) lebih suka menciptakan sesuatu yang baru dari pada memperbaiki yang telah ada | | | | | |
| | c. aya (pimpinan saya) serng melakukan hal yang beresiko secara berbeda | | | | | |
| | d. saya (pimpinan saya) sering memiliki cara pandang baru terhadap masalah lama | | | | | |
| 22 | Keterlibatan Pemilik/Pimpinan perusahaan | | | | | |
| | a. Pemilik/pimpinan perusahaan terlibat dalam adopsi e-commerce | | | | | |
| | b. Pemilik/pimpinan perusahaan terlibat dalam implementasi e-commerce | | | | | |
| | c. Pemilik/pimpinan perusahaan memimpin perubahan | | | | | |
| 23 | Pemahaman Pemilik/pemimpin perusahaan terhadap Teknologi informasi | | | | | |
| | a. pimpinan perusahaan pernah mengikuti kursus atau pelatihan komputer | | | | | |
| | b. pimpinan perusahaan menggunakan komputer di rumah | | | | | |
| | c. pimpinan perusahaan menggunakan komputer di kantor | | | | | |
| | d. pimpinan perusahaan memiliki sertifikat formal terkait dengan penggunaan komputer | | | | | |
| | e. saya merasa pemahaman komputer dari pimpinan perusahaan adalah sangat baik dibandingkan dengan orang lain di posisi yang sama | | | | | |

24. pilihlah kondisi yang mencerminkan kamampuan aktual anda (pimpinan perusahaan anda) dalam menggunakan komputer dan sistem informasi lainnya,
    1. Menunjukkan tidak berpengalaman
    2. Menunjukkan sedikit berpengalaman
    3. Menunjukkan kemampuan rata-rata

4. menunjukkan cukup berpengalaman
5. menunjukkan sangat berpengalaman

| | | level kemampuan anda | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| | Kemampuan dalam menggunakan sistem operasi seperti: mocrosoft windows, linux, unix, ubuntu... | | | | | |
| | kemampuan dalam menggunakan paket komputer seperti: excel, word document,atau database | | | | | |
| | kemampuan dalam membangun model visual seperti: keuangan, statistik ataupun grafik | | | | | |
| | kemampuan menggunakan internet dan www untuk komunikasi dan pertukaran data | | | | | |

25. berikut ini adalah beberapa keuntungan penggunaan e-commerce, nyatakanlah pendapat anda mengenai keuntungan tersebut dengan skala 1 sampai 5, dimana
    1 menunjukkan sikap sangat setuju
    2 menunjukkan sikap setuju
    3 menunjukkan sikap netral
    4 menunjukkan sikap tidak setuju
    5 menunjukkan sikap sangat tidak setuju

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| a. pendapatan/penjualan perusahaan meningkat | | | | | |
| b. biaya operasional perusahaan berkurang | | | | | |
| c. biaya pembelian dan pengadaan perusahaan berkurang | | | | | |
| d. biaya pemasaran berkurang | | | | | |
| e. loyalitas pelanggan meningkat | | | | | |
| f. keluhan dari pelanggan berkurang | | | | | |
| g. hubungan dengan pemasok semakin baik | | | | | |
| h. posisi persaingan semakin baik | | | | | |
| i. pangsa pasar semakin luas | | | | | |
| j. kecepatan pemprosesan semakin baik | | | | | |
| k. komunikasi dengan pihak luar (seperti: pemerintah, supplier, pelanggan, pesaing ) semakin baik | | | | | |
| l. citra perusahaan semakin baik | | | | | |
| m. komunikasi internal semakin baik | | | | | |
| n. kepuasan karyawan semakin meningkat | | | | | |
| o. produktivitas semakin meningkat | | | | | |

**Bagian 6. Faktor Demografi**

26. Nama responden : …….

27. Jenis Kelamin
    a. perempuan
    b. laki-laki
28. Umur
    a. dibawah 25 tahun
    b. 25 tahun - 34 tahun

c. 35 tahun - 44 tahun
d. 45 tahun - 55 tahun
e. diatas 55 tahun

29. Pendidikan terakhir
a. SMP sederajat
b. SMA sederajat
c. D1-D3
d. Sarjana
e. Pasca Sarjana (S2)
f. Doktor (S3)

30. Posisi/jabatan anda di perusahaan (sebutkan): ……

**#Terima Kasih atas partisipasi Bapak/Ibu#**