

**MOTIVATOR AND INHIBITOR FACTORS  
INFLUENCING SMALL MEDIUM SIZED  
ENTERPRISES (SMES) IN WEST MALAYSIA  
TO ADOPT E-COMMERCE**

**LIM SENG CHEE**

**UNIVERSITI SAINS MALAYSIA**

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TO ADOPT E-COMMERCE**

by

**LIM SENG CHEE**

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## **LIST OF ABBREVIATIONS**

<b>ACCCIM</b>	Associated Chinese Chamber of Commerce & Industries Malaysia
<b>B2B</b>	Business to Business
<b>B2C</b>	Business to Consumer
<b>B2G</b>	Business to Government
<b>C2B</b>	Consumer to Business
<b>C2C</b>	Consumer to Consumer
<b>IS</b>	Information System
<b>MATRADE</b>	External Trade Development Corporate
<b>MSC</b>	Multimedia Super Corridor
<b>PGCC</b>	Penang Chinese Chamber of Commerce
<b>SME</b>	Small Medium Enterprise
<b>SMECORP</b>	SME Corporation

**MOTIVASI DAN DEMOTIVASI FAKTOR-FAKTOR  
MEMPENGARUHI PENGGUNAAN E-DAGANG DI KALANGAN  
PERUSAHAAN KECIL SEDERHANA DI MALAYSIA BARAT**

**ABSTRAK**

Penggunaan e-Dagang dalam kalangan perusahaan kecil dan sederhana di Malaysia masih rendah dan belum mencapai sasaran yang ditetapkan oleh pelan kerajaan. Objektif kajian ini ialah untuk mengkaji tahap penggunaan e-dagang dalam kalangan perusahaan kecil dan sederhana (SME), dan memeriksa hubungan antara manfaat, halangan, sokongan pihak pengurusan atasan, kesediaan organisasi, tekanan persaingan, sokongan kerajaan serta penggunaan e-Dagang. Selain itu, tiga faktor iaitu produktiviti pengurusan, sokongan operasi dan bantuan keputusan strategik dari nilai strategik yang dilihat digunakan untuk kesan keserhanaan ke atas faktor penentu. Hasil kajian menunjukkan penggunaan e-Dagang ialah berkadar sederhana. Faktor penentu kepada SME bersaiz kecil adalah sokongan pihak pengurus atasan, kesediaan organisasi, tekanan daripada pesaing dan sokongan kerajaan. Pada sudut yang lain, faktor penentu untuk SME dari kategori sederhana adalah sokongan pihak pengurusan atasan, tekanan persaingan and sokongan kerajaan. Sokongan operasi (OS) mempunyai kesan keserhanaan ke atas SME bersaiz medium. Kajian ini mengesahkan kepentingan sokongan operasi yang mempunyai pengaruh ke atas pihak pengurusan atasan dan persepsi mereka terhadap teknologi e-Dagang dari sudut implementasi terhadap organisasi mereka untuk meningkatkan kecekapan.

# **MOTIVATOR AND INHIBITOR FACTORS INFLUENCING SMALL MEDIUM SIZED ENTERPRISES (SMES) IN WEST MALAYSIA TO ADOPT E-COMMERCE**

## **ABSTRACT**

The e-Commerce adoption among small and medium sized enterprises in Malaysia is low. It does not reach the target set in government's plan. The objective of this study is to investigate the level of e-Commerce adoption among SMEs and to examine the relationship between perceived benefits, perceived barriers, top management support, organization readiness, competitor pressure, government support and e-Commerce adoption. Besides that, three variables: managerial productivity (MP), operational support (OS) and strategic decision aids (SD) from Perceived Strategic Value (PSV) are used to study the moderation effects of these determinant variables. The finding shows that the level of e-Commerce adoption is moderate. The determinant variables of small sized SMEs category to e-Commerce adoption are top management support, organization readiness, competitor pressure and government support. On the other hand, the determinant variables for medium sized SMEs category to e-Commerce adoption are top management support, competitor pressure and government support. The OS has moderation effects on medium sized SMEs. This study confirmed that the importance of the OS has influence on top management level or top manager perception of e-Commerce technologies in term of implementation in their organization to increase effectiveness.



# CHAPTER 1

## INTRODUCTION

### 1.1 Background of the Study

The number of Internet users is rapidly increasing. According to the Miniwatts Marketing Group, in year 2000, the number of Internet users globally was 360 million, and a total of 2 billion was achieved in year 2011 (MMG, 2001-2012). Presently it has reached 3 billion (MMG, 2001-2015). The growth of Internet population encourages many innovative web applications for users. Electronic commerce (e-Commerce) is one of the new innovative creations from the Internet. The rapidly changing technologies encourage much innovative software for users that will eventually reduce their daily job routines and enhance organization effectiveness. The successful e-Commerce stories about online largest book store such as Amazon.com, and popular web hosting company, like the Rackspace (Napier et al., 2005) have encouraged many Small Medium Enterprises (SMEs) and industries to adopt e-Commerce.

The great influence power of Internet and e-Commerce has drawn the attention of the Malaysian government. In year 1997, the Malaysian government has invested money and introduced the Multimedia Super Corridor project (MSC) to the public. The objective of the project is to be a world class technology company and to groom the local Internet Communication Technologies (ICT) companies (MDEC, 1996-2016; MrElimtiaz's, n.d.). Besides MSC, there are other government agencies such as MIMOS, Small and Medium Enterprise Corporation Malaysia to assist in this mission (Kamaruzaman & Handrich, 2010).

E-Commerce brings immense benefits which influence the SMEs to invest in information facilities in their organization (Alam, Khatibi, Ismail, & Ahmad, 2005; Downing, 2006; Thulani, Tofara, & Langton, 2010). The fundamental-Commerce applications (i.e., website and e-mail) bring benefits to organization (Ahmad, Abu Bakar, Faziharudean, & Mohamad Zaki, 2015). First, they enabled faster communication within the organization. Secondly, they helped to manage the organization's resources more efficiently. Thirdly, they enabled data sharing through the network to improve data processing, business processes, back-end office function such as organizing invoice, preparing invoice and logistic tracking.

Unfortunately, after a decade, e-Commerce adoption among the SMEs is still relatively low. As such, e-Commerce adoption issue has gained the attention from the government agencies and academicians to investigate. Although the e-Commerce adoption is low, it still has potential to grow (E-Commerce Potential, 2015). According to Omar, Ramayah, Lin, Mohamad, and Marimuthumar (2011) the general usage of web-based marketing among SMEs in Malaysia is low, particularly in the state of Penang. Web-based marketing application like e-mail is the most widely used application, whereas the least used application is online payment system (Omar et al., 2011).

One of the barriers to adopt e-Commerce is Internet security issues. For example, sensitive and valuable data risk being wiretapped by unethical groups during transmission. As a consequence, the company encounters unexpected tragedies such as financial loss. Besides, software design issues and non-technical problems including but not limited to high maintenance cost, and lack of skilled workers also bring negative perceptions to the small SMEs about the Internet and e-Commerce technology. In order to avoid such problems, the majority of the employers prefer to

retain the current practice, which is the traditional and established methods for their daily businesses. They are reluctant to leave their comfort zone (Kamaruzaman & Handrich, 2010). Among the non-technical issues that lead to reluctance of local SMEs to adopt e-Commerce include (a) lack of skilled workers (ACCCIM, 2012; Alam et al., 2004; Kamaruzaman & Handrich, 2010), (b) poor Internet infrastructures (ACCCIM, 2012; Alam et al., 2004; Kamaruzaman & Handrich, 2010; Paynter & Lim, 2001), and (c) attitude toward e-Commerce (Omar et al., 2011; Paynter & Lim, 2001). This research would like to identify the level of e-Commerce adoption, and potential factors and barriers to influence the SMEs' decision to adopt e-Commerce. Additionally, it seeks to examine the moderation effects of Perceived Strategic Value on these factors.

## **1.2 Research Problem**

In most developing countries, SMEs play important roles as an economic catalyst to boost the country's economy. In Malaysia, the SMEs constitute the majority of business establishments in Malaysia at 99.2% (SME Corp, Malaysia, 2014). SMEs contribute about 32% of GDP, 59% of total employment (Teng, 2012) and 19% of exports (SME Corp, 2014).

E-Commerce brings many benefits to SMEs and provide strong stimulus to national economy. E-Commerce allows organization to reduce operational cost (Duan, Deng, Corbitt, 2012; Iacovou, Benbasat, & Dexter, 1995; Tan, Chong, Lin, & Eze , 2010), improve cash flow (Betty, Shim, & Jones, 2001; Bordonaba-Juste, Lucia-Palacios, & Polo-Redondo, 2012; Iacovou et al., 1995), provide higher quality of information (Downing, 2006; Thulani et al., 2010; Turban, Chung, Lee, & Chung 2000), improve operational efficiency (Bordonaba-Juste et al., 2012; Iacovou et al., 1995; Turban et al., 2000), provide better customer service (Betty et al., 2001;

Downing, 2006; Turban et al., 2000), improve trading partner relationships (Alam et al., 2005; Tan et al., 2009; Teo & Pian, 2004), improve company's image (Abou-Shouk Megicks, & Lim, 2013; Gunasekaran & Ngai, 2005; Wang & Ahmed, 2009) and provide new business opportunity (Betty et al., 2001; Gunasekaran & Ngai, 2005; Thulani et al., 2010).

The outstanding benefits of e-Commerce had convinced the government to allocate some budgets into ICT developments. The government and respective agencies have provided assistance such as giving financial support and by enforcing the cyber laws in order to boost e-Commerce adoption. For example, in the Ninth Malaysia Plan (2006 - 2010), the government had allocated RM 12.9 billion to boost up the e-Commerce confidence level. The government had also enforced cyber laws such as the Personal Digital Signature Act 1997, Communication and Multimedia Act 1998, Copyright Act 1997, Telemedicine Act 1997 and Personal Data Act 2010 to encourage SME to adopt e-Commerce into their organization.

Prior literature reviews claim that e-Commerce brings benefits to the national economic within the context of developed countries. In developing countries, people fail to reap benefits from innovative technologies (Kshetri, 2007). SMEs have adopted e-Commerce but they are still in entry adoption level (i.e. using email and website) and not moving beyond this stage (Molla & Licker, 2005). Based on the ACCCIM 2012 SMEs survey conducted by the Association Chinese Chambers of Commerce & Industry of Malaysia, 28% of the respondents were involved in e-Commerce activities, while 24% of the respondents stated they were planning to employ e-Commerce in future (ACCCIM, 2012). Furthermore, the e-Commerce usage and activities still remain at entry level. Studies of e-commerce adoption across the state of Peninsular Malaysia especially in manufacturing sector had been

carried out, but they were only focused on specific areas. For example, studies done in the Northern Malaysia (Yeng, Yeng, Osman, Haji-Othman, & Safizal, 2015), the Southern Malaysia (Tan et al., 2010), and Klang Valley (Ahmad et al., 2015). Consequently, these results do not represent the actual situation of e-Commerce adoption in Malaysia as a whole. It is important and useful to examine e-Commerce adoption from various perspectives, especially from the top management level. The decision to adopt or reject e-Commerce is based on the consensus of the management board. If the strategic values surpass the perception about e-Commerce investment, the top management will decide whether to accept or reject innovative technology. Therefore, it is important to formulate a systematic approach to determine the factors influencing SMEs to adopt e-Commerce, to improve their business process, efficiency, and business performance.

### **1.3 Research Objectives**

In this research, there are three research objectives, stated as the following:

- (a) The first objective is to determine the level of e-Commerce adoption among SMEs in West Malaysia.
- (b) The second objective is to determine the relationship between perceived benefits, perceived barriers, top management support, organization readiness, competitor pressure, government support, and e-Commerce adoption.
- (c) The third objective is to investigate the moderator effects of managerial productivity, operational support and strategic decision aids on the relationship between perceived benefits, perceived barriers, top management support, organization readiness, competitor pressure, government support and e-Commerce adoption.

#### **1.4 Research Questions**

In this study, there are also three research questions, stated as the following:

- (a) What is the level of e-Commerce adoption among Small Medium Enterprises (SMEs) in West Malaysia?
- (b) Do Perceived Benefits, Perceived Barriers, Top Management Support, Organization Readiness, Competitor Pressure and Government Support have positive relationship on e-Commerce adoption among Small Medium Enterprises (SMEs) in West Malaysia?
- (c) Do Managerial Productivity, Operational Support and Strategic Decision Aids strengthen the relationship between Perceived Benefits, Perceived Barriers, Organization Size, Top Management Support, Organization Readiness, Competitor Pressure and Government Support with e-Commerce adoption?

#### **1.5 Research Scope**

This study is limited to SME manufacturing firm in Peninsular Malaysia. Additionally, the target audience from adopter of e-Commerce are from Peninsular Malaysia, who has the decision making power, such as chief executive officers, managers, and senior executives. The adopter is someone who had used e-Commerce applications such as email, website, online form, electronic data transfer, and other related applications in their organization.

#### **1.6 Significance of the Research**

This study contributes to the theoretical body of knowledge about determinant factors influence Small Medium Sized Enterprises in West Malaysia to adopt e-Commerce and the practical implementation of the E-Commerce.

### **1.6.1 Theoretical Contributions**

The main theoretical contribution of this thesis can be summarized as follows:

- (a) This study provides some insights on top management's perspective of adopting e-Commerce based upon the TOE model and perceived strategic value. In particular, perceived strategic value acts as the moderator in the relationship between the independent variables and dependent variable (e-Commerce adoption). More specifically, the research investigates the moderation effects of managerial productivity, operational support and strategic decision aids.
- (b) Different types of technologies have different impacts on the innovation adoption. However, there is a lacking of established e-Commerce adoption model in Malaysia, especially in the manufacturing sector. Therefore, the second contribution is to establish an e-Commerce adoption model that investigates the factors to adopt e-Commerce.
- (c) To extend the TOE model by introducing new variables. In this context, the new variables may be adapted from other research models. Such variables may be effective predictors of e-Commerce adoption, worth further investigation. Consequently, the finding of this study will likely increase the academic knowledge of e-Commerce in the Malaysian context.

### **1.6.2 Practical Contributions**

In this section, the main practical contributions are enumerated as follows:

- (a) The findings may be useful for SMEs in strategic planning. In particular, the three moderators (managerial productivity, operational support and strategic decision aids) are especially important as they provide SMEs the opportunities to gain insight into their strengths, capabilities, and weaknesses.

- (b) To facilitate decision-making by practitioners with regards to the type of technologies and applications. Proper evaluation scheme can be devised based upon the findings. Hence, SMEs can be more aware of the internal and external challenges.
- (c) It provides a guideline for government agencies and non-profit organizations to evaluate their existing policies, strategic, and regulatory framework for promoting e-Commerce among SMEs in Malaysia. SME Corporation (SME Corp), Malaysia External Trade Development Corporation (MATRADE); Non-government related bodies: Association Chinese Chambers of Commerce and industries Malaysia (ACCCIM), and Penang Chinese Chambers (PGCC) as some examples of government agencies and non-profit organizations that may benefit from the current findings.

## **1.7 Definition of Terms**

The terms commonly used in this thesis are described as follows:

***E-Commerce Adoption*** is the use of e-Commerce technologies to support operations, management, and decision-making in the business based on organization, environmental, and technological factors (Thong & Yap, 1995; Tornatzky & Fleischer, 1990).

***Perceived Benefits*** is referred to the extent of anticipated advantage that a particular technology can provide the organization (Iacovou et al., 1995).

***Perceived Barrier*** refers to the extent of negative perceptions on the acceptance of e-Commerce technologies (MacGregor & Vrazalic, 2005).

***Top Management*** refers to the extent of active engagement of top management with e-Commerce implementation within organization (Ifinedo, 2011a; Thong, Tap, & Raman, 1996).



***Organizational Readiness*** has two components; financial resources refers to whether an organisation has sufficient financial resources to invest on new technologies, and technological resources which refers to the level of technology sophistication of IT usage and IT management in an organization (Iacovou et al., 1995).

***Competitor Pressure*** refers to the extent of competitors from market that takes the lead and enjoys advantages brought by the e-Commerce technologies (Wang & Ahmed, 2009)

***Government Support*** refers to the extent of assistance provided by the authority such as government and government agencies to encourage the spread of innovations in businesses (Ifinedo, 2011a).

***Operational Support*** refers to the extent of information systems primarily used to reap operational efficiency benefits and aid operational strategies through cost reduction, improved customer service, improved support to operations and other related strategies (Subramanian & Nosek, 2001).

***Managerial Productivity*** refers to the extent of information systems providing better access to information, help in the management of time, provide means to use generic methods and models in decision-making, and improve communication among managers through the use of electronic calendars, electronic mail, project management tools, and access to internal and external databases (Subramanian & Nosek, 2001).

***Strategic Decision Aids*** refers to the extent of information systems supporting strategic decisions (Subramanian & Nosek, 2001) and to aid managers in decision-making with the availability of information and industry linkages (Saffu, Walker, & Hinson, 2007).

## **1.8 Organization of Thesis**

The structure of this thesis is as follows: Chapter 2 is devoted to literature reviews on e-Commerce, the underlying theories, and factors that influence e-Commerce adoption. In Chapter 3, the model formulation and hypothesis formation based on previous literature reviews are discussed. Detailed description of the research methodology can be found in Chapter 4. Thereafter, Chapter 5 presents the data analysis and main findings of this work. The thesis concludes with further discussion of the work, and proposes new avenue for research in Chapter 6.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Overview**

The information age has changed the nature of commerce, from the barter system, to monetary system, and to virtual money in online transactions. Ainin and Noorismawati (2003) had identified nineteen categories of e-Commerce applications usage in Malaysia, including prepaid cards, smart cards, credit cards, electronic fund transfer, logistics, procurement, online sales order, online application, e-mail, customer feedback, online product updates, online help, Frequent Ask Questions (FAQ), electronic catalogues, third party website, homepage/website, display information and product, research on competitors, research on suppliers and research on consumer.

The Internet has great influence to the society where it brings tremendous opportunities that enable entrepreneurs and SMEs to operate online businesses with low start-up fees and low entry barriers into the cyber marketplace. There are many successful online businesses with different business model settings, such as Business-to-Consumer (B2C) and Business-to-Business (B2B). For example, Amazon.com and e-bay.com are prominent online businesses. In this chapter, e-Commerce definition, concepts, and some prior e-Commerce literature reviews are discussed.

### **2.1.1 E-Business**

Zakaria and Hashim (2003) stated that there is no universal definition to e-business. Various “*concepts about the e-business, e-commerce, business via computer networks, Electronic Data Interchange (EDI) and Internet commerce are often used interchangeably to mean the same thing. The definitions of e-business appear to vary among different authors and researchers*” (Zakaria & Hashim, 2003).

According to Napier et al. (2005), many people use the term e-Commerce “*in broader sense to encompass not only the buying and selling of goods, but also include delivery and exchange of information, provide customer service pre-sale and post-sale, collaboration with business partner, and the effort to improve productivity within organizations.*” People nowadays interchange the meaning of e-business and e-Commerce (Napier et al., 2005).

## **2.2 E-Commerce from Various Points of Perspective**

The term of e-Commerce differs according to the different usage and perspectives from academician, researcher, and practitioners. Meanwhile, Kalakota and Whinston (1997) defines e-Commerce from four different perspectives: management, marketing, economic and technology. The following section discusses e-Commerce definition from various points of view.

### **2.2.1 Management’s Perspective of E-Commerce**

In the last decade, Kalakota and Whinston (1997) defined the term of e-Commerce as the application of technology toward the automation of business transactions and work flow. O'Daniel (2000) agreed and followed the definitions stated by Kalakota and Whinston (1997). In management context, automation process is the keyword to reveal e-Commerce characteristic.

### **2.2.2 Marketing's Perspective of E-Commerce**

From marketing's perspective, Kalakota and Whinston (1997) stated e-Commerce provides the capability of buying and selling products, information on the Internet and other online services. In marketing context, the used of e-Commerce is to disseminate information and products information to target audiences.

### **2.2.3 Economic's Perspective of E-Commerce**

Kalakota and Whinston (1997) stated e-Commerce is a tool that addresses the desire of firms, consumers, and management to cut service cost while improving the quality of goods and increasing the speed of delivery. In the economic context, e-Commerce is considered as a tool.

### **2.2.4 Technology's Perspective of E-Commerce**

From technology's perspective view, Kalakota and Whinston (1997) stated e-Commerce is the delivery of information, product/services, or payments over telephone lines, computer networks, or any other electronic means. O'Daniel (2000) extended the definitions of Kalakota and Whinston (1997); hence defining e-Commerce as the delivery of information, products, services, and payments via computer networks. In this technology context, delivery of information and electronic medium are the best keywords to express it.

### **2.2.5 The Conceptual and Definition of E-Commerce in This Study**

In the last decade, there are many e-Commerce researches available. However, these e-Commerce adoption researches define the term e-Commerce differently. This is because the context of their study is from difference perspective, view, purpose, and objectives. For example, Ahmad et al. (2015) view e-Commerce as a mean to improve communication within organization and make organization more efficient

and effective. Strauss and Frost (2009) mentioned e-Commerce as one of the subset of e-business focused on activities that include buying/selling online, digital value creation, virtual market place, and store front, and new distribution channel intermediaries.

There are many e-Commerce definitions available, but Hashim and Noor (2014) mentioned that there are two elements best describe e-Commerce. Firstly, the type of business activities such as sharing of business information, buying and selling, and secondly, types of technologies that enable business activities.

In this study, the term of e-Commerce refer to the process of buying, selling, information exchange or conduct business-related activities using various e-Commerce technologies ranging from emails, electronic catalogues (Internet marketing), electronic fund transfer, as well as electronic data exchange to connect to their suppliers, intermediaries, consumers and potential partners through digital telecommunication medium.

### **2.3 Type of E-Commerce Adoption Studies**

There are four types of e-Commerce adoption researches. The first type is focused on e-Commerce innovative characteristics. The second type is focused on either technology benefits or technology barriers. The third type is focused on e-Commerce adoption in developed or developing countries. The forth type is comparison of e-Commerce adopter and non-adopter. This study is focused on SME manufacturing sector. It is necessary to conduct this research because there is limited research on e-Commerce adoption in Peninsular Malaysia.

The first type of e-Commerce studies on the conventional technology adoption are focused on different e-Commerce innovative characteristics which will lead to e-Commerce adoption (Poorangi, Khin, Nikoonejad, & Kardevani, 2013; Ramayah,

Mohamad, Omar, Marimuthu, & Leen, 2013). Examples of these e-Commerce adoption researches are Electronic Data Interchange (EDI) adoption conducted by Iacovou et al., (1995); Kuan and Chau, (2001); and Musawa and Wahab (2012), B2B e-Commerce adoption by Tip and Lim (2011) and Sila (2013), website adoption by Betty et al., (2001) and Omar et al. (2011), and enterprise application adoption conducted by Ramdani, Chevers and Williams (2013).

The second type of e-Commerce studies focused on technology benefits such as reducing operational cost, improving customer service quality and improving company image (Alam et al., 2005; Tan et al., 2010) that will lead to e-Commerce adoption. On the other hand, prior literature on e-Commerce adoption also focused on technology barriers such as high IT investment cost, the need to hire IT consultant, network and computer security issues (Alam et al., 2004; Seyal & Rahman, 2003) which lead to resistance to adopt e-Commerce into their organization.

The third type of e-Commerce studies is focused on developed countries (Ifinedo, 2011a, 2011b; Sila, 2013), and developing countries (Chiliya, Chikandiwa, & Afolabi, 2011; Edwin & Peter, 2014; Govindaraju & Chandra, 2011; Janita & Chong, 2013) that lead to the e-Commerce adoption in the respective country.

The fourth type of e-Commerce adoption research is a comparison between e-Commerce adopter and non-adopter (Sila & Dobni, 2012; Sutanonpaiboon & Pearson, 2006) to investigate the characteristics which lead to adoption.

These studies showed that e-Commerce adoption may vary in difference contexts and contributed by many factors which influenced e-Commerce adoption. Therefore it is necessary to conduct a study in Malaysia. As a result, various factors influencing e-Commerce adoption among Small Medium Enterprises in Malaysia is investigated in this study.

### **2.3.1 Conceptualization of e-Commerce Adoption**

There are five streams of e-Commerce adoption concepts, as following:

The first concept is by assessing the factors with various aspect of views such as perceived relative advantage, perceived compatibility, perceived complexity, e-Commerce knowledge, management attitude towards e-Commerce, external change agents, pressure from trading partners, pressure from competitor, CEO attitude, network reliability, data security, scalability, firm size, industry type, financial source availability, owner's experience, education level, and trust context (Ahmad et al., 2015; Ifinedo, 2012; Omar et al., 2011; Sila, 2013) which lead to technology adoption.

The second concept is by assessing classical technology characteristics as the best predictor to explain significant factor to adoption (Kendall, Tung, Chua, Ng, & Tan, 2001). This type of research focus on technology characteristics such as: relative advantage, compatibility, complexity, observability and trialability. For example, Ramayah et al. (2013) and Poorangi et al. (2013).

The third concept is by contrasting the adopter and non-adopter characteristic. For example, Aziz and Jamali (2013) had compared between adopter and non-adopter in e-Commerce adoption studies in Iranian SMEs with respect to usage of various e-Commerce tools such as e-mail, Intranet, Extranet/VPN, websites, EDI, EFT, ESCM. In additional, Huy, Rowe, Truex, and Huynh, (2012) had conducted e-Commerce adoption study to investigate factors of influence in Vietnam and to differentiate between adopter and non-adopter. Finally, the study of e-procurement adoption in Singapore was conducted by Teo, Sijie, and Kee-hung (2009).

The fourth concept is by identifying benefits and barriers of using e-Commerce. For example, Jahanshahi, Zhang, and Brem (2013) had compared between three



country context: India, Iran and Malaysia, in Asia context. Additionally, Tan et al. (2010) conducted a study of Internet based ICT adoption among SMEs by assessing demographics versus benefits, barriers, and intention of adoption.

The fifth concept is identifying the antecedence and post-adoption of e-Commerce. For example, the study of Bordonaba-Juste et al. (2012) and Zhu and Kraemer (2005).

This study belongs to the first concept. It assessed various factors of influence to e-Commerce adoption. Sila (2013) mentioned that although various study factors have been conducted, the context where these factors are applicable with exception, are neglected. In fact, some of the context is useful, which also can be influential to create a successful system, but unfortunately overlooked. Therefore, this study attempts to highlight some issues on e-Commerce adoption in the Malaysia context.

## **2.4 Adoption Theories**

This research applied TOE framework. The following section discusses three important theories and models which are widely applied in innovative technology adoption research: (a) Diffusion of Innovation – Organization Innovativeness (DOI-OI), (b) Iacovou's Adoption model, and (c) Technological Organizational Environmental Framework (TOE). Both of the DOI-OI framework and Iacovou model are important because these models will lead to TOE framework in the research. The following section provides a review on the adoption theory. Furthermore, these theories will be contrasted in term of similarities and differences.

### **2.4.1 Diffusion of Innovation – Organization Innovativeness**

Based on DOI theory at firm level, innovativeness is related to independent variables such as individual (leader) characteristics, internal organizational structural characteristics, and external characteristics of the organization. The diffusion of

innovation – organization innovations is presented as Figure 2.1. The definition for respective variables can be referred to in Appendix A.

Based on the model, organization's attitude towards change has positive relationship with innovativeness. Čorejová and Podperová (2012) mentioned that centralization is an important factor. When more power is concentrated in an organization, it will decrease the organization innovativeness. In this model, Rogers (2003) further explain that the complexity encourages organizational members to conceive and propose innovations, but it may make it difficult to achieve consensus about implementing them. Besides that, he mentioned the formalization acts to inhibit consideration of innovation by organization members, but it also encourages implementation of innovation.

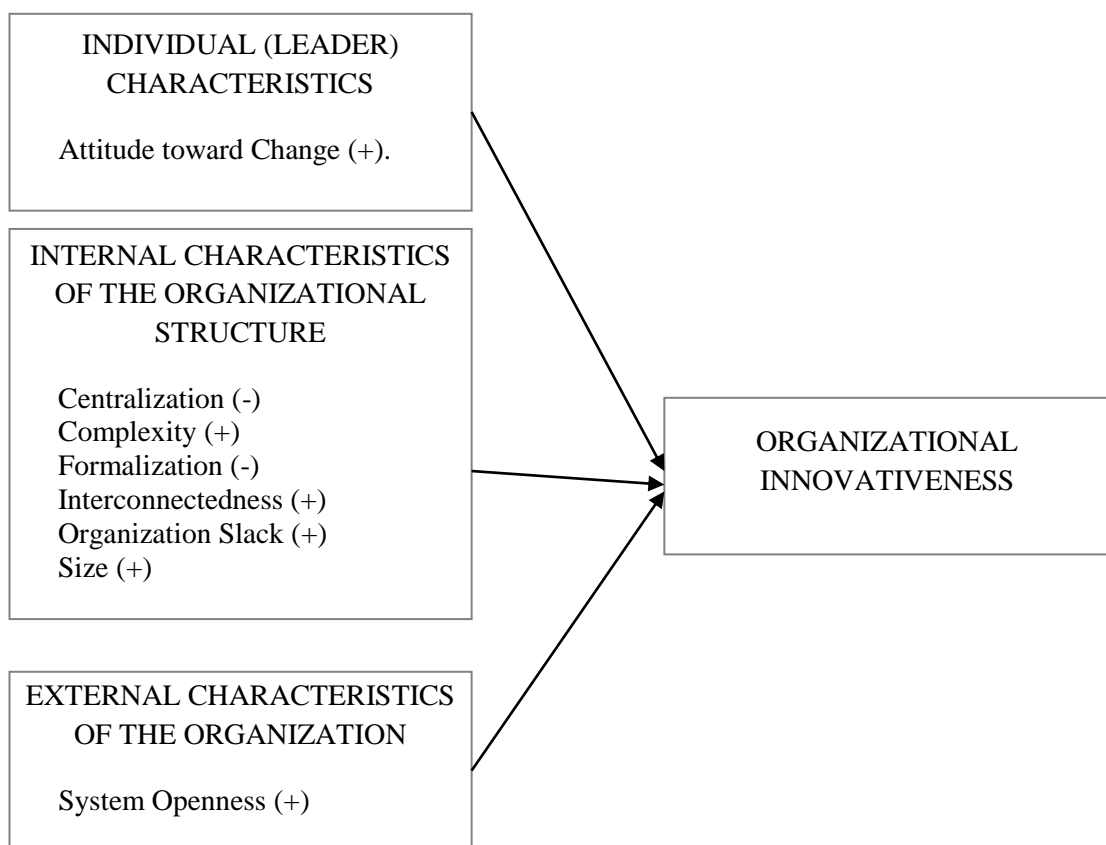


Figure 2.1: Diffusion of Innovation – Organization Innovativeness (Rogers, 2003)

In addition, Rogers (2003) mentioned that new ideas can flow more easily and rapidly among an organization's members if it has higher interconnectedness, and this variable is positively related to organizational innovativeness. Organization slack is important to ensure consistence resource is available to support operation. Organizational slack has positive relationship with organization innovativeness (Čorejová & Podperová, 2012). In this model, size has positive relationship with organization innovativeness. The external characteristics of an organization refer to system openness. It has positive relationship with organization innovativeness.

#### 2.4.2 Iacovou's Adoption Model

In this adoption model, there are three factors (Iacovou et al., 1995): (a) perceived benefits of EDI, (b) organizational readiness, and (c) external pressures were identified as the factors to explain the EDI adoption behaviour of small firms and the expected impact of the technology. The Iacovou model is depicted as the following Figure 2.2. The definition for respective variables can be referred to in Appendix A.

Iacovou et al. (1995) had summarized his research's result, he mentioned that the pre-adoption awareness of EDI benefits is low. It needs promotion to increase the awareness.

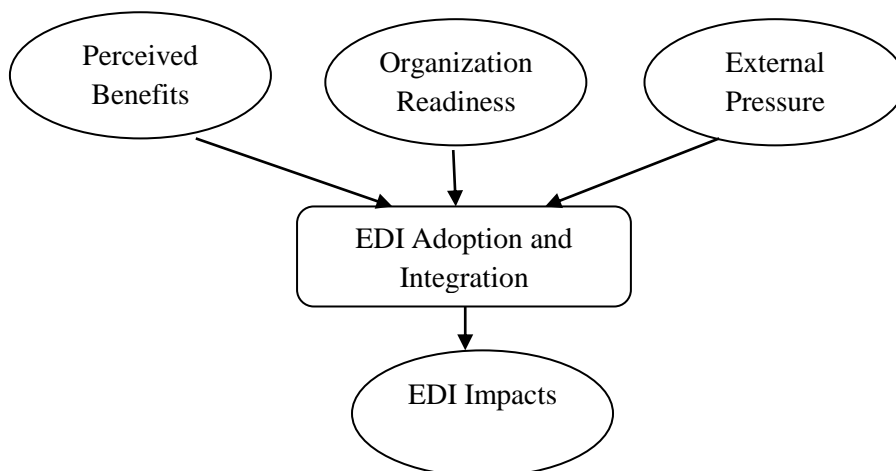


Figure 2.2: Iacovou's Adoption Model (Iacovou et al., 1995)

The overall readiness of small organization is insufficient for adoption. Therefore, it needs more financial, technological and managerial assistance. Finally, external pressure has strong influence to EDI adoption.

### 2.4.3 Technological Organizational Environmental Framework

Tornatzky and Fleischer (1990) had introduced a framework named Technological Organizational Environmental (TOE) to investigate information system studies. In this framework, it contains three contexts, namely, (a) technological, (b) organizational, and (c) environmental as shown in Figure 2.3. TOE framework is useful for studying the adoption and assimilation of different types of IT innovation (Ahmad et al., 2015; Oliveira & Martins, 2011). Furthermore, this framework has solid theoretical basis, consistence empirical support (refer to Chapter 3) and potential of applications to information system domain through specific factors identified by respective contexts across different domains (Oliveira & Martins, 2011).

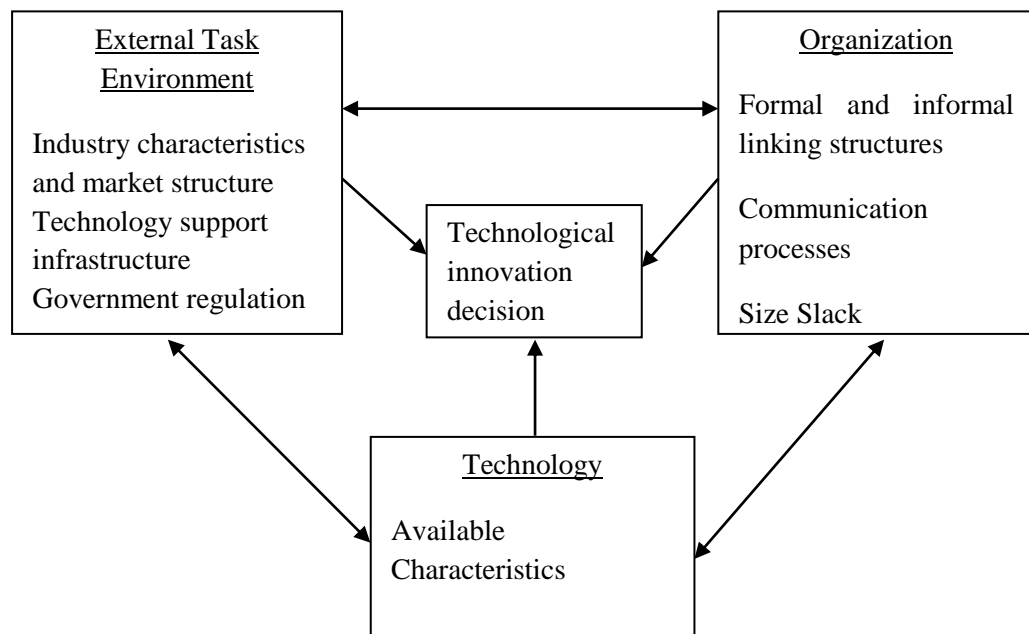


Figure 2.3: Technology Organization Environment Framework  
(Tornatzky & Fleischer, 1990)

## **2.5 The Application of TOE Framework in This Research**

The literature shows the linkage between three theories, Diffusion of Innovations-Organizational innovativeness (DOI-OI), Iacovou's model, and Technological Organizational Environmental Framework.

Previous IS study focused on technology acceptance model (TAM) (Davis, 1989), theory reasoned action (TRA) (Ajzen & Fishbein, 1977), theory of planned behaviour (TPB) (Ajzen, 1991) or unified theory of acceptance and use of technology (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2013) to explain a particular behaviour intention toward innovative adoption. However, these theories are limited on individual level not organization level.

The first motivation to conduct this research, is that there is limited research adoption in firm level especially in organization level. In fact, the decision to adopt innovation into organization is determined by organization level not by customers.

The second motivation to use this TOE framework is that DOI-OI model and Iacovou model share similarity in term of model structures (i.e., these model has three main contexts). For example, Iacovou's model is derived from DOI-OI model. It almost followed the original structures, and removed the leader characteristic context and added in perceived benefits context. This TOE model is consistent with DOI-OI model (Oliveira & Martins, 2011; Sila & Dobni, 2012; Tornatzky & Fleischer, 1990). The additional environmental context shows the opportunity and threats from uncertainty environment.

The third motivation, is because TOE framework has environmental context. It is new, and not found in other models. The environmental context explains the opportunity and constraints for technology innovation. Furthermore, the

technological context is flexible compared to other model, as any technology characteristic can be grouped inside it.

Lastly, the TOE framework can be varied on difference study contexts such as website adoption, e-market, e-business, EDI, Enterprise application as mentioned by Oliveira and Martins (2011), which has explained power and their technology characteristic. For examples, Janita and Chong (2013), Zhai and Liu (2013), Aziz and Jamali (2013), Li and Xie (2012), Huy et al. (2012), Ajmal and Yasin (2012), Rodríguez-Ardura and Meseguer-Artola (2010), and Chong, Lin, Ooi and Raman (2009). As a result, this study applied TOE framework to investigate factors influence to SMEs to adopt e-Commerce.

## **2.6 The Focused Constructs in This Study**

This study focuses on various determinant factors influencing the e-Commerce adoption. Based on the previous literature reviews, some study factors from different contexts and perceived strategic value are used to explain innovative adoption. This research is split into two domains. First is the determinant variables. Secondly, it is the perceived strategic value variables. The Figure 2.4 depicts the construct of this study. Next, the following section describes in details for each variable in term of (a) various definitions, measurement items in respective construct and (b) conceptualization for respective variable.

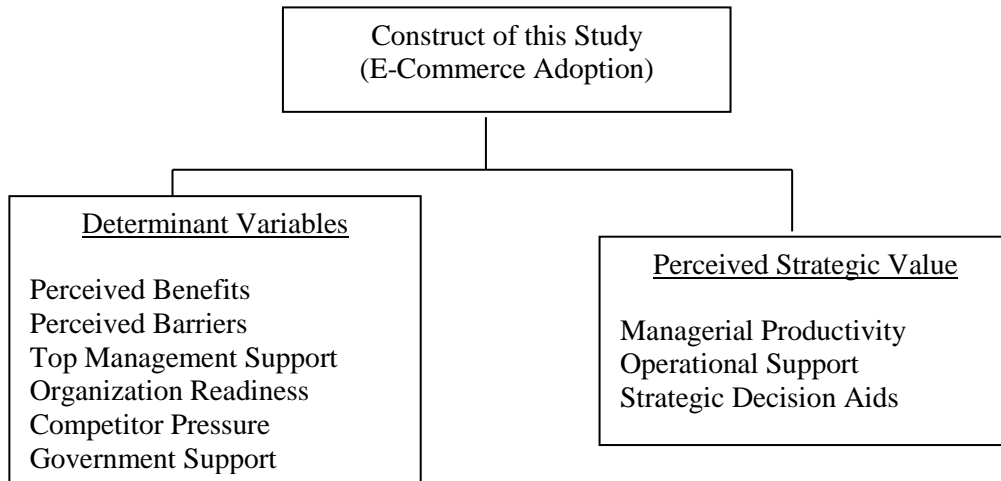


Figure 2.4: Construct of the Study

### 2.6.1 Adoption

Diffusion and adoption are one of the popular topics of information system research finding areas to investigate about new innovation acceptance and perception by the public. However, each researcher defined the term of adoption in various ways and concepts as following:

#### (a) Definition of Adoption

In the DOI model, adoption is referred to as the decision to make full use of an innovation as the best course of action whilst rejection is a decision not to adopt an innovation. In the TOE model, adoption or acceptance of innovations depends on organizational, environmental, and technological factors (refer to 2.4.3). Meanwhile, in Iacovou's (refer to 2.4.2) model, adoption is the process during which a firm becomes capable of transacting via Electronic Data Interchange (EDI), usually through a front-end, personal computer (PC) based EDI server.

Thong and Yap (1995) defined adoption as using computer hardware and software applications to support operations, management, and decision-making in the business.

Tan et al. (2010) defined adoption as the decision to use internet-based ICT communication to communicate and/or conduct businesses with stakeholders and rejection implies decision not to adopt internet-based ICT in the business operations of the SME.

Bordonaba-Juste et al. (2012) defined adoption as a strategic decision to take measures within the firm to maximize the effectiveness of this adoption.

### **(b) Conceptualization of Adoption**

There are two concepts about the adoption. First, the adoption concept refers to respective theoretical model. Second, adoption concept refers to decision-making to use innovative technologies in organization.

The first concept refers to the respective models, where the adoption is based on their research context. For example, DOI, Iacovou, and TOE.

The second concept refers to decision-making using innovative technologies in organization. For examples, Thong and Yap (1995), Tan et al., (2010), and Bordonaba-Juste et al. (2012).

Both of the concepts have different aspects. This study would like to combine both of the concepts, in broader sense. It will not limit the researcher in the research boundary, and it also will explore e-Commerce adoption in Malaysia context. This study adapted the adoption definition from Tornatzky and Fleischer (1990) and Thong and Yap (1995) to extend the scope of adoption as following: e-Commerce Adoption is the use of innovative computer technologies to support operations, management, and decision-making in the business based on organizational, environmental, and technological factors.