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**Barriers of B2B e-Business Adoption in Indonesian SMEs: A
Literature Analysis**

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Abstract

Information and Communication Technology (ICT) is increasingly recognized as a key resource for most of the firms' business performances and the presence of electronic business (e-Business) has indeed brought a significant impact on business practices. The development of B2B e-Business and the use of Internet technologies significantly improve the way companies deal with their customers and suppliers. However, some barriers are still prevailing associated with the adoption of e-Business, especially in emerging country such as Indonesia. Although Indonesia has the largest amounts of small and medium enterprises (SMEs) in South East Asia, yet the number of e-Business participation in Indonesia is still considered very low, particularly in B2B sectors. Moreover, there is paucity of studies of B2B e-Business adoption for Indonesian SMEs. Therefore, this paper is aimed to give greater insight on how the Indonesian SMEs' response towards B2B e-Business and identify the barriers that hindered them to implement B2B e-Business. This research fills a gap about B2B e-Business adoption barriers and overcomes some of the fragmentation associated with e-Business adoption for SMEs in emerging economies.

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1. Research background

Many academics and practitioners have admitted that Information and Communication Technology (ICT) has brought a significant transformation on business practices (Sebora et.al, [1]; Vijayaraman and Bhatia, [2]; Sam and Eam, [3]; Abu-Musa, [4]). The impacts of ICT are also caused a profound in Business-to-Business (B2B) sectors. For instance in the United States of America (USA), B2B online transactions reached the total amount of US\$56.8 billion which accounts 70 percentage of the Internet economy revenues in 1999 Keenan, [5]. Moreover, the development of ICT has enabled B2B to use Internet as a business tool to obtain greater competitive advantages, capture global markets and increase the efficiency of business transaction processes (Al-Somali et al., [6]). Therefore, due to the benefits above, many firms are appealed to implement Internet-based technologies as their e-Business application infrastructure (Lin, [7]).

E-Business is defined by Turban et.al [8], as a developing concept that portrays the process of exchanging or buying and selling products, services and information through computer networks involving the Internet. Additionally, Abu-Musa ([4], pg. 28) refers e-Business implementation involving "all kinds of commercial activities performed across computer platforms and applications, including direct selling (e-tailing), customer relationship management (CRM), supply chain management (SCM) and the use of Internet as a medium to conducting business transaction". Sebora et al. [1] demonstrates that there is a significant growth of information exchange and business transaction over the web throughout the world. Moreover, the benefits of adopting e-Business are not only limited to large companies, yet it gives the same opportunities for small and medium enterprises (SMEs) to obtain greater benefits and becoming more competitive and productive by participating in e-Business (Poon and Swatman, [9]; MacGregor et al., [10]).

1.1 Research motivation

B2B transactions over public and private sectors uses the Internet as a delivery vehicle for transactions (e.g. financial transfer, on-line exchanges, auctions, delivery of products and services) provides more effective means which businesses can be transacted electronically between trading partners (Zhao et al., [11]). However, B2B research is still low compared to the B2C sector, especially in emerging countries where only a limited research opportunities exists (Sam and Eam, [3]; Reimers,[12] ; Zhao et al., [11]). For instance, Indonesia, as one of the emerging country has the largest amount of SMEs in South East Asia (53 million), yet Indonesia is considered lagging behind in term of e-Readiness (The World Economic Forum and INSEAD, [13]). The small number of B2B e-Marketplaces in Indonesia has also indicated that Indonesian SMEs have not been an active B2B e-Business player. Thus, it may imply that only small numbers of SMEs have Internet access, even there is lesser number of SMEs who has indeed applied and obtained the benefits of adopting e-Business. This condition is notwithstanding the fact that only few researches have been done to analyze the development of e-Business in Indonesia (Kartiwi, [14]; Rokhman, [15]). Further research is needed to understand the main barriers for Indonesian SMEs in adopting e-Business in B2B sectors. Therefore, this study is aimed to evaluate and identify the barriers that impinge Indonesian SMEs to adopt in B2B, in order to address the low adoption rate of B2B e-Business in Indonesia.

1.2 Research problems

Regardless of e-Business proliferation and the benefits offered, however Indonesian SMEs are still ignoring and hesitating to adopt e-Business, which they considered it as a new phenomenon. Furthermore, issues such as poor infrastructure and inadequate online policies (Shakir et.al, [16]), which has made Indonesia lagging behind in term of networked readiness and particularly in adopting e-Business. The report from World Economic Forum and INSEAD in 2012 has ranked Indonesia in 80th position (from 142 countries) based on its Networked Readiness Index (NRI), which made Indonesia in a lower position compared to other Asian Pacific countries (Singapore, 2nd, Malaysia 29th, China 51st and Thailand 77th). The ranking of the NRI was assessed on four factors including: environment (political and regulatory; business and innovation), readiness (infrastructure, affordability, and skills), usage (individual, business and government) and impact (socio and economic).

Although currently Indonesian SMEs have the same opportunity to expand their market and seize the benefits of e-Business, yet SMEs' participation and adoption in e-Business are still considered low due to several barriers such as: (1) risk averse and strong influence from the owner or manager in adopting IT (Matlay and Addis, [17]), (2) slower adoption towards new technology due to its unfamiliarity with ICT (Thong,[18]), (3) the lack of resources in IT knowledge, experts and financial resources (DeLone, [19]; Zhu, Kramer and Xu, [20]; Eriksson et al, [21]), (4) SMEs have restricted control over business environment and power to influence their partners to implement e-business (Zhu, Kramer and Xu, [20]) and (5) avoid investing on sophisticated application or software (Sutanonpaiboon and Pearson, [22]; Writz and Wong, [23]; Jones and Beatty, [24]). In fact, SMEs play an essential role and are crucial growth engine in global economic, where generally SMEs constituted more than 90 percent of the businesses in a country (Sutanonpaiboon and Pearson, [22]; O'Hara et al., [25]; Thong, [18]). Therefore, it is important to heed that great attention should be given to Indonesian SMEs since in 2010, total amount account approximately 53 million SMEs, which comprises 99.99 percentage of the total businesses in Indonesia (Indonesian Ministry of Cooperatives and Small Medium Enterprises Indonesia DEPKOP, [26]). However, the numbers of Indonesian SMEs who have adopted e-Business are still considered very low, which is a crucial issue to be addressed in order to improve Indonesian economic growth and international trade.

2. Literature overview

Jeffcoate et al. [27] describe e-Business involves internal and external process that involves operational, managerial and strategic advantages, which enable firms to have closer relationship with its customers and suppliers. Therefore, the success of e-Business adoption is represented by the ability to integrate the internal elements and external diffusion (Lin, [7]). In the context of SMEs, the internal integration is associated with the main internal part such as: the owner-manager and the organizational, whereas the external diffusion influenced by the external influencer such as: trading partner and government. However, the following section of this paper will explore the both internal and external factors that impinge the adoption of e-Business for Indonesia SMEs, particularly in B2B sector.

2.1 Benefits of e-Business

It is worth to note that the presence of Internet has offered greater advantages for businesses (Lin, [7]; Poon and Swatman, [9]; Vijayaraman and Bhatia, [2]). Businesses could obtain several benefits by participating in e-Business such as: reduce transaction cost due to elimination of middleman, identify new market, improve intra and inter-organization communication, engaging better relationship with suppliers and having more opportunities to have larger playing field with other larger companies (Evans and Wuster, [28]). Moreover, Poon and Swatman [9] claimed there are five main benefits linked to the adoption of e-Business as: ability to have wider exposure in the market, direct and indirect marketing, lower communication cost, capture more market and enhance company image. Hence, shifting to the implementation of e-Business would not only bring abundant benefits to firms but also allowing them to assess greater opportunities to achieve efficiency and effectiveness as their competitive advantage.

2.2 E-Business and technology issues in emerging countries

Some literatures have recognized that SMEs in developing countries have a slower adoption rate compared to other developed countries (Intrapairot and Srivihok, [29]; Molla and Licker, [30]) which is caused by environmental, managerial and organizational constraint that made developing countries encounter greater risks than developed countries (Molla and Licker, [30]). Moreover, emerging countries often faces several issues including lack of e-Business policies and regulation, inadequate infrastructure, trust and security (Zhao et.al, [11]; Shakir et.al, [16]). In some developing countries, personal computer (PC) penetration has not been well distributed is also an evident of low e-business readiness (Fleenor and Raven, [31]). For instance, Fleenor and Raven [31] revealed that PC distribution in Philippines and Thailand is only 20PC per thousand people, whereas in Singapore is 510 PC. In some part of Indonesia, telecommunication infrastructure is still in a poor state where there is only 0.2% of telephone line density (Economist Intelligence Unit, [32]). This is a serious problem for emerging countries because of improper telecommunication infrastructure and high cost Internet access and these could become the main inhibitors for businesses to participate in e-Business (Fleenor and Raven, [31]). Furthermore, e-Business also offers a better way of business transaction between buyers and sellers, where in emerging countries, it might become a problem due to undeveloped online policies and regulation to control online transaction (Shakir et.al, [16]). A study on Brazilian consumers shows that low e-commerce adoption in Brazil is caused by privacy, security and taxation concern, lack of business laws regulation for e-commerce and poor legal protection for online purchases (Kshetri, [33]). Furthermore, in China, trust and security is considered to be one of the dominant obstacles where RMB 5.5 billion is loss due to violations and fraud, followed by loss of RMB 200 billion from low quality and counterfeit products (Zhao et al., [11]). Thus, developing countries should be aware on these issues while developing and improving its strategy for e-Business adoption in their country.

2.3 Definition of Small and Medium Enterprises in Indonesia

Defining the term of Small and Medium Businesses is sometimes controversial and arguable (Street and Meister, [34]). There are various ways to determine the definition of SME and differ across countries. Therefore, the ideal definition is subject to one's perspective and based on the aim of the study (Nooteboom, [35]). SMEs are categorized based on the classification from Indonesian Small Medium Enterprises Organization (DEPKOP) and The Central Bureau of Statistics (CBS) in Indonesia (DEPKOP, [26]; Kartiwi, [14]) (Table 1). The different classification of Indonesian SMEs is depicted in the size of employee; where in small firms in Indonesia has 5-19 employees compared to most part of Europe with 5-50 employees (Nooteboom, [35]).

Table 1. The Definition of Small and Medium Enterprises in Indonesia

Small Enterprise (UU No. 20/2008)	<ul style="list-style-type: none"> Asset > Rp. 50 Million- Rp. 500 Million (Excluding Land and Building) Annual Sales Volume > 300 Million- Rp. 2,5 Billion and/or
Central Bureau Statistic (BPS)	<ul style="list-style-type: none"> Employees: 5-19 people

Medium Enterprise (UU No.20/2008)	<ul style="list-style-type: none"> • Asset Rp.500 Million- Rp. 10 Billion (Excluding land and building) • Annual Sales Volume > Rp. 2 Billion - Rp. 50 Billion and/or
Central Bureau Statistics (BPS)	<ul style="list-style-type: none"> • Employees: 20-99 people

Source: Indonesian Small Medium Enterprises Organization (DEPKOP) [26]; Kartiwi [14]

2.4 E-Business supports for Indonesian SMEs

Indeed, low ranking of Indonesian NRI by the World Economic Forum and INSEAD [13] has also prompted Indonesian government and citizen to recognize the fretting condition of Indonesian e-Readiness. The assessment of the report have indicated that Indonesia is still lagging behind in term of e-Readiness such as: (1) lacks of policies and regulatory on software protection and business development, regulation on facilitating PC penetration and support ICT (2) poor telecommunication infrastructure in mobile network coverage, Internet bandwidth and secure Internet server (3) low affordability of Internet access through fixed Internet broadband or telephone mobile line (4) limited in ICT experts and skills (5) low numbers of Individual, Business and Government participation on ICT diffusion and penetration. According to Julta et al. [36], government plays a major role to assist ICT diffusion, where government programs and efforts in partnering with SMEs could boost SMEs development in digital economy (e-Business). Moreover, government support could also enhance SMEs knowledge in e-Business by providing funding for e-Business research centres and facilitating e-Business adoption for SMEs through seminars and workshop (Julta et al., [36]).

According to a research from an Internet content delivery companies, Akamai in 2012, Indonesia is one of the lowest broadband provider in Asia Pacific (KOMPAS, [37]). The report also identified that only 0.82% of Indonesian Internet users that can access Internet speed above 4Mpb. Furthermore, the Association of Indonesian Internet Service Provider (APJII) also stated that the high cost of bandwidth, poor fibre-optic infrastructure and limited PC penetration have attributes to low Internet diffusion in Indonesia (Economist Intelligence Unit, [32]). However, in recent years, there is a significant growth of Internet users in Indonesia, which constitute 20% growth and therefore placed Indonesia in the fifth position as the fastest growing number of Internet users after China, Australia, Japan and Hong Kong (KOMPAS, [37]). APJII also identifies that the price of bandwidth in Indonesia will decrease around 50% in the next few years due to more ISP providers serving Indonesian market (Economist Intelligence Unit, [32]). This would be an advantage for Indonesian SMEs in adopting B2B e-Business, as many experts believed that consistent broadband connectivity and availability in a country is fundamental to support B2B e-Business adoption (Zakaria and Janom, [38]).

On the other hand, in order to adopt B2B e-Business successfully, SMEs should not only depend on their internal company's perspectives but also have to consider the industry/market and IT service providers (external support) standpoint (Reimers et al., [12]; Shakir et al., [16]). This is further illustrated by Reimers et al. [12] that the presence of ICT will be useless if a company is not ready and understands about the benefits of ICT from the e-business perspective. Likewise, if the company with high state of ICT adoption might find difficulties to build external contact with other party if they have not adopt or still in their early stages of adoption. Therefore, the integration between SME, external support and also their market or partners is crucial for B2B e-Business implementation.

2.5 SMEs characteristics and B2B e-Business adoption

It is widely recognized that SMEs adhere different characteristics with large companies (DeLone, [19]; Fillis and Wagner, [39]), where the owner-manager of the SMEs possessed a dominant role in decision-making in the adoption process (Fillis et al, [40]). Hodson and Whitelock [41] also discussed the importance of owner-managers as key players in deciding e-Business implementation in smaller firms. They believed that without aspiration from the owner-manager and the poor knowledge of IT will likely inhibit SMEs to adopt e-Business. Likewise, the owner involvement and knowledge are equally crucial in adopting new technology (DeLone, [19]). Therefore, if the owner or the manager of the firms is not opened to new technology innovation and have no competency and knowledge on managing e-Business, it is most likely that the firms are not adapting to e-Business. Moreover, Mirchandani and Motwani [42] demonstrated that positive results of adopting e-business yield from the enthusiasm from the top management, company knowledge about computers, perceived advantages of e-business, and whether e-business is

congruence with company's strategy. Cragg and King [43] also argued that the owner and employees of the firms who show their receptiveness and enthusiasm towards changes could encourage the adoption of e-Business. Thus, it is important to understand the owner or manager's motivations, perceived values, their attitudes and value in adopting to new technology or innovations (Fillis et al., [40]).

Indeed, SMEs are often characterized with limited resources (Eriksson et al., [21]; DeLone, [19]) that served as a barrier for B2B e-Business adoption. The limited resources include lack of expertise in ICT, knowledge about implementing ICT and also financial resources. Thus, SMEs are inclined not to adopt any ICT and invest in new technology or innovation unless they are assured of the generated competitive advantage (Thong, [18]). However, though SMEs are restricted in term of resources, Ramayah et al. [44] suggests that SMEs should not ignore the significance of ICT and need to embrace new technologies in their businesses. Storey [45] have also identified that owner or managers in small firms tend to have diversified objectives, which many of the owner-managers are only considering to obtain minimum level of income, rather than maximizing their profits. This might serve as a barrier that inhibits SMEs to obtain greater benefits from e-Business implementation to improve their business performance. Another factors that hindered SMEs to adopt B2B e-Business were also identified by Zhu, Kraemer and Xu [20], as they lack of power to influence partners to adopt B2B e-Business with them and therefore difficult to achieve economies of scale. They also mentioned the prominence of consumer readiness, firm scope, technology competence, and competitive pressure as main adoption facilitator. Besides, Lin [7] claimed that organizational learning is crucial in the process of adopting new technologies or IT in the firms. Moreover, organizational capabilities in dealing with new innovation will eventually facilitate IT development and diffusion in the organization (Lin, [7]). Therefore, it is clear that in order to encourage SMEs adoption of e-Business, SMEs need to be more receptive in adopting new technology and innovation.

2.6 Literature summary

According to Zakaria and Janom [38]'s conceptual framework, there are eight essential aspects to be considered in evaluating firms' readiness on e-Business, involving: individual, enterprise, government readiness, competency, technology, business process, market forces and supporting industries. However, with the integration of the previous theories and conceptual framework from the literature above (of Zakaria and Janom, [38]; Fillis et al., [40]; Shakir et al., [16]; Thong, [18]; Reimers et al., [12]; Lin, [7]), this paper has identified six key indicators that will be used in analysing the barriers for Indonesian SMEs in adopting B2B e-Business (Figure 2). The six key indicators are based on: individual, organization, technology, market and industry, external support and government support. As Jeffcoat et al. [27] defined e-Business involved both internal and external process; consequently those seven key indicators will be classified into internal and external factors, based on the source of the impacts. The internal factors are caused and arise within or inside the company, while the external factors are developed or influenced from outside of the company.

The internal factors consist of individual and organization. Individual in SMEs sectors will be the owner-manager since they are the key decision maker that determines the adoption of e-Business (Fillis et al., [40]; Thong, [18]). In this section, owner-manager's attitudes, perceptions and also knowledge about the benefits of implementing e-Business will be studied because it is essentials to understand each individual perspective that leads to the decision in adopting e-Business. Likewise, organization learning and knowledge of ICT are equally important to the adoption of e-Business. As Lin [7] stated that if an organization has a receptive culture towards new innovations and technologies will ultimately enable them to adapt to e-Business. Thus, another important factor to be considered is from the internal perspective of SMEs' readiness and receptiveness of the organization itself.

On the other hand, the external factors include: technology, market and industry, external support and government support. Some major issues for emerging countries to adopt e-Business implementation are caused by the poor technology penetration (PC) and lack of telecommunication infrastructure and external support that provides IT services and e-Business support. Thus, it is important to examine each of the availability of these aspects to determine whether this is one of the major barriers that impinge those SMEs in adopting B2B e-Business. Similarly, government support and the readiness of the market or industry are essential in encouraging e-Business adoption. Therefore, understanding SMEs' awareness and perception of the government support is required to recognize to what extent those SMEs have been assisted and aware of the current government support in e-Business. Moreover, the examining the readiness of both SMEs' market and industry are also crucial to point out whether the willingness of e-Business adoption are influenced by pressure or influenced from the its market and industry.



Figure 2. Factors affecting B2B e-Business adoption for SMEs

Table 2. Literature summary of B2B e-Business adoption for Indonesian SMEs

Key Elements	Description	Source
Individual	Owner-managers attitude towards e-Business	Sutanonpaiboon and Pearson,[22]; Fillis et al., [40]; Tornatzky and Fleischer, 1990; Zakaria and Janom, [38]; Thong, [18]; Fillis and Wagner,[39]
	Benefits of implementing e-Business to the organization	
Organizational	Knowledge of adopting e-Business	Zakaria and Janom,[38]; Sharkir et al., 2007; Lin, [7]; Thong[18]
	Expertise in ICT	
	Organization culture and technology penetration	
Technology	Technology penetration in the country	Tornatzky and Fleischer, 1990; Sutanonpaiboon and Pearson, [22]; Zakaria and Janom,[38]; Shakir et al., [16]
	The availability and affordability of the technology in the country	
	Technology to support e-Business	
Market and Industry	The adoption of e-Business by supplier and buyers	Zakaria and Janom, [38]; Reimers et al., [12]
External Support	The number of IT service provider or consultant	Tornatzky and Fleischer, 1990; Zakaria and Janom, [38].
	The awareness of those IT service providers and trust of the providers.	
	The number of Telecommunication providers and supports	
Government Support	SMEs' awareness of Government e-Support	Zakaria and Janom,[38]; Shakir et al., [16]; Molla and Licker,[30]; Julta et al.,[36].
	SMEs' perception of Government e-Support	
	Government initiatives towards the implementation of e-Business	
	The availability of research centers to support e-Business learning	
	Regulation and policies for e-Business	

2.7 Research contribution

The findings of this paper will not only identify the main barriers that hinder Indonesian SMEs in adopting e-Business, yet points out factors that are essential to the adoption process of e-Business in developing countries. Thus,

the conceptual framework or findings of this paper might be applicable to other developing countries that have similar problems as Indonesia. This paper will also identify SMEs' attitudes towards e-Business adoption, which might be important parameter to comprehend SMEs willingness in adopting e-Business. Therefore, SMEs could focus on and start dealing with their problems in order to obtain the benefits from implementing e-Business. Furthermore, government support is essential in facilitating e-Business adoption for SMEs, thus the result of this research could be used as a reference or a guideline for policies makers and governments in Indonesia to support and improve B2B e-Business adoption.

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