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Antecedents of e-commerce adoption in Thai SMEs

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Abstract

E-commerce (EC) is viewed as a new strategy to survive and stay competitive in the highly changeable business environment. In this paper, the model of EC antecedents and effects is examined in nine Thai managers within the targeted firms operating in a variety of industries. Results indicate that the adoption of EC is contingent upon organizational, environmental, and technological elements, which in turn affects company performance. The modes of EC operations include brand awareness, cost saving, business transaction and information providing, customer relationship, and process improvement. Different EC applications has been adopted, comprising e-mail, E-SCM, social media platforms, website and CRM. The implications of the findings in relation to EC theory and practice are discussed. This paper provides useful insights into the viewpoints of EC adoption in Thai SME context, which practitioners in similar settings may find useful.

Keywords: E-commerce adoption, Firm performance, SMEs, Developing countries

Introduction

E-commerce (EC) can be a major driver for growth and economy transformation in developing countries (Hajli et al, 2014) and the growing use of internet platforms can be one of critical factors to create major changes for Thailand's economy transformation. The current Thai government aims to transform Thailand's economic structure to becoming a value-based and innovation-driven economy. Therefore, the research focusing on Small and Medium Enterprises (SMEs) is critical (Awa et al, 2015) because SMEs play a significant role in the country's economic development, particularly Thailand. SMEs account for 99.72% of the total number of enterprises and contribute to 41.1% of the country's GDP (OSMEP, 2015).

SMEs are increasingly encountered severe competition both from their domestic and foreign competitors (Abebe, 2014). In order to stay competitive, the use of internet offers SMEs "to build competitive advantage through improved transparency and communications, real-time and value-added knowledge sharing, operational flexibility and efficiency, and network externalities" (Awa et al, 2015, p. 144). The adoption of EC is increasing at the global level (Abebe, 2014; Hajli et al, 2014), however, Internet platforms are still under-exploited by SMEs in the developing countries (Awa et al, 2015, p. 144), particularly Thailand (Sena-noi and Jaroenwanit, 2011). The survey of Electronic Transactions Development Agency or ETDA (2017) found that the value of EC in Thailand during 2014-2016 was increased by 10.41% from 2014 to 2015 and by 12.42% from 2015 to 2016. In spite of the growing number of EC businesses in Thailand, SMEs are not exploiting EC to its full potential. The majority of SMEs are located in Bangkok and metropolitan area and have utilized the Internet more for advertising their stores and products and less for buying and selling products through the Internet (Choochinprakarn, 2016, p.2). Moreover, the information system (IS) research has mainly focused on large firms (Abebe, 2014; Ghobakhloo et al, 2011) in developed countries (Hajli and Sims, 2014) and the studies on adoption and use of EC in SMEs, particularly in developing countries (Chatzoglou and Chatzoudes, 2016; Ghobakhloo et al, 2011; Ifinedo, 2011) like Thailand is limited (Sena-noi and Jaroenwanit, 2011). Ghobakhloo et al (2011) note that small and large businesses have different characteristics and contexts, so that the findings of previous studies on large businesses cannot be generalized and applied to smaller firms. Therefore, there is a noteworthy need to investigate the causes behind such relatively low adoption of EC in SMEs, particularly in Thai context.

Although the scholars recently pay more attention to study EC acceptance in SMEs, the literature has mainly been narrowed to exploratory research that

study numerous factors impacting EC acceptance in SMEs (Abebe, 2014, p. 101). Very few research has constructed on the prior studies while several studies have developed a unique conceptual framework, thereby failing to build on existing knowledge (Chatzoglou and Chatzoudes, 2016). This paper enriches the literature as it uses technology-organization-environment (TOE) framework as a basis for analysis. TOE framework is the most popular methodological approach and has been found to "provide consistent empirical support" in the literature (Ghobakhloo et al, 2011, p. 1243). In addition, there is a lack of integrative framework to clarify EC adoption and its impact on firm performance. Thus, the integrative framework is significant for future studies, policy makers and practitioners (Li and Xie, 2012). Furthermore, while prior studies provide valuable insights into operational aspects of EC adoption, there is a dearth of empirical research on the implementation process for EC adoption (Chatzoglou and Chatzoudes, 2016). A holistic understanding of the subject under study is necessary, especially for SMEs where financial resources are restricted (McCarthy et al., 2014). Therefore, qualitative research can be used to gain deeper understanding of the phenomenon of interest (Leung, 2015). Therefore, this paper provides a more holistic view which covers a wider variety of cases in SME context in order to build greater depth and richness into the knowledge base.

This paper aims to cover the limitations of the literature described above. Its main objective is to examine the antecedents and consequences of EC adoption in SMEs. Specifically, the research questions of this paper are as follows: (1) what factors are critical to successfully implementation of EC in Thai SMEs? (2) how do those factors support and motivate Thai SMEs to adopt of EC applications? (3) what are the outcomes achieved by Thai SMEs that implement EC in their operations? (4) how does EC adoption improve organizational performance? The subsequent sections are structured as follows. First, it presents a review of literature on the determinant factors influencing EC adoption and the relationship between EC adoption and firm performance in SMEs in developing countries. Then a theoretical framework are proposed. Next, research methodology are presented and results are discussed. Finally, conclusions and implications as well as future research directions are drawn.

Literature review

EC definition and its benefits to SMEs

There are various definitions of EC and most scholars focus on "the use of the internet to process and facilitate business" (Hajli and Sims, 2014, p. 720). EC is defined as a wide range of online business activities relating to products

and services (Jahanshahi et al, 2013, p. 850). According to Abebe (2014, p. 102) explains EC from the B2C viewpoint as "the buying and selling of information, products and services via computer networks". Following Ghobakhloo et al (2011, p. 1243), this paper describes EC as "utilization of ICT and applications to support business, operation, management, and decision making in business".

With the advancement in information communication technology (ICT), the benefits of EC comprise cost reduction (e.g. for transactions, operation and marketing), ease of accessibility for end users, efficiency of business processes and dealing with suppliers, and ease of connection with potential customers in the global market (Hajli and Sims, 2014; Jahanshahi et al, 2013). EC can be a competitive tool to offset SMEs' resource constraints and size disadvantages (Abebe, 2014) as it reduces costs and increases their geographical reach (Abebe, 2014; Hajli and Sims, 2014; Yasin et al, 2014). Although EC provides SMEs the great opportunities to increase their performance and achieve competitive advantage, most of SMEs are likely to use the internet more to send mails, transfer files or gather information and less to develop services, processes, business automation and internal processing of business information and knowledge (Awa et al, 2015, p 144). Therefore, the guidelines on how to inspire and encourage extensive acceptance of EC in SMEs are needed.

The factors influencing EC adoption

According to literature review, there are several elements have been employed to influence EC adoption. Based on the TOE framework (Tornatzky and Fleischer, 1990), the antecedences of EC adoption comprise three dimensions as follows:

Technological context

Technological level of an organization has been reported as a critical factor that impacts the adoption and implementation of an IS/IT innovation such as EC (Chatzoglou and Chatzoudes, 2016; Ghobakhloo et al, 2011). In this paper, perceived benefits and government policies and supports are proposed to assess the level of technological readiness of SMEs.

Perceived Benefits. Perceived benefits involve the relative advantages that EC can provide to the embracing company (Ifinedo, 2011, p. 259). In accordance with Roger's (1983) DOI theory, perceived relative advantage is the determinant factor of new systems adoption. Likewise, Davis's (1989) Technology Acceptance Model (TAM) indicates that perceived usefulness of a system is a precursor factor of new technology acceptance and usage process. Correspondingly, Al-Bakri and

Katsioloudes (2015) have found that perceived usefulness is one of key factors affecting EC acceptance and usage behavior in SMEs in Jordan. Ghobakhloo et al (2011)'s findings are consistent with Roger's (1983) DOI model and Davis's (1989) TAM model and have revealed that CEOs of SMEs who recognize the benefits of EC are more likely to embrace EC applications. Similarly, Hajli and Sims (2014, p. 726) suggest that the better awareness and understanding of the advantages of EC adoption the more likely EC are accepted and used by SMEs in developing countries. Therefore, perceived benefits is likely to encourage SMEs to adopt EC.

Government Policies and Supports. Government plays an important role in enhancing e-business initiatives in SMEs in developing and emerging countries (Li and Xie, 2012). Jeon et al (2009) have discovered that government support is the most significant determinant factors for e-business adoption process in Korean SMEs. Likewise, the findings of Durbhakula and Kim's study (2011) have suggested that government policy and vision impact on e-business enhancement. The government's policies, visions, strategies and support programs, taxes and tariffs, regulatory frameworks, subsidies and support infrastructures (Awa et al, 2015, p. 148) will formulate the e-readiness (e.g. quality of IT infrastructure) in every country (UNCTAD, 2013). Then e-business improvement will increase on the whole country (Chatzoglou and Chatzoudes, 2016). Therefore, government policies and supports are likely to foster SMEs to adopt EC.

Organizational context

Chang (2010, p. 106) describes organizational perspective as the "enterprise's availability of financial and human resources". The literature has reported that an IS innovation can be successfully accepted and implemented only when adequate organizational resources are provided and wisely managed (Chatzoglou and Chatzoudes, 2016; Ifinedo, 2011). These resources may comprise adequate stuff, technical skills and funding (Chatzoglou and Chatzoudes, 2016). In this paper, organizational IS competence and management commitment and support are proposed to measure the level of organizational readiness of SMEs.

Organizational IS Competence. Organizational IS competence involves the level of knowledges, experiences, technical skills and expertise of IS technologies in the organization (Ghobakhloo et al, 2011). The more knowledge a company has about technological innovation, the more likely the firm intends to adopt new technologies (Ifinedo, 2011). Al-Bakri and Katsioloudes (2015) have found that managers' knowledge and awareness of IT and IS as well as IT skills of managers and organizational members influence the adoption of EC systems in SMEs in Jordan. Similarly, Hajli and Sims (2014) have discovered that organizational

awareness in terms of ICT literacy and English language skills of employees and managers impact the adoption process of EC in SMEs in Iran. However, owners and employees of SMEs and micro firms seem to lack sufficient knowledge of IT and e-business, resulting in a delay in the growth of ICT use in their businesses (Ifinedo, 2011). The study of Ifinedo (2011) has revealed that a lack of IS competency hinders SMEs to successfully adopt internet and e-business technology (IEBT). Therefore, SMEs will successfully adopt EC where their executives and organizational members have adequate IS skills and expertise.

Management Commitment and Support. Top management commitment and support is defined as the involvement, enthusiasm, motivation and encouragement provided by management regarding the reception of IS technologies (Ifinedo, 2011, p. 260). Ifinedo (2011) have reported that management commitment/support is positively related to successful IEBT adoption in SMEs. When top managers understand the important of computer and related technologies for their companies, they are inclined to play a vital role in motivating other members in the organizations to accept such technologies (Chatzoglou and Chatzoudes, 2016; Ghobakhloo et al, 2011). Moreover, these managers tend to reserve resources to technology acceptance (Thong et al, 1996). Previous research have showed that management support and commitment can facilitate and speed up the new technologies acceptance in SMEs (Ghobakhloo et al, 2011). Therefore, management commitment and support is likely to promote SMEs to adopt EC.

Environmental context

External environment of an organization has been reported in the literature as a driver for IS adoption in large and small businesses (Ghobakhloo et al, 2011). In this paper, the main sources of external pressure to accept technological innovations in SMEs are competitive pressure and financial resources availability (Ifinedo, 2011).

***Competitive Pressure*.** Competitive pressure has been reported in the literature as one of the best predictors of IS implementation in large and small enterprises (Ifinedo, 2011). SMEs adopt and use EC strategies with an aim to stay competitive and innovative as a necessity for their survival (Ghobakhloo et al, 2016). Correspondingly, Al-Bakri and Katsioloudes (2015, p. 732) have found that local and global competitions are the drivers of managers/owners' decisions in small firms to implement EC systems in order to maintain their competitive position. As such, SMEs in the industries having high rate of innovation and fierce competitive challenge are likely to adopt e-business (Chatzoglou and Chatzoudes, 2016; Ghobakhloo et al, 2011). Therefore, an environment of intense competitive pressure tends to lead to EC adoption in SMEs.

***Financial Resources Availability*.** A lack of financial resources is an obstacle to IEBT utilization in SMEs (Ifinedo, 2011; Yoshino and Taghizadeh-Hesary, 2016). Such resources shortage would require to source for funding as they believe that the adoption of online businesses and related solutions are valuable for their businesses (Ifinedo, 2011). However, SMEs cannot easily obtain finance from local financial institutions (Yoshino and Taghizadeh-Hesary, 2016). The weak financial situation of SMEs and the struggle to invest in complicated IS have been reported as major barriers in previous research results (Somuyiwa and Adebayo, 2011). Al-Bakri and Katsioloudes (2015, p. 732) have found that financial readiness influences SMEs in Jordan to adopt EC. According to Al-Bakri and Katsioloudes (2015, p. 732), financial readiness is "the availability of financial resources to pay for EC system adoption costs, use of subsequent enhancement and continuing expenses such as communications charges and usage fees". Ifinedo (2011, p. 267) concludes that SMEs with better financial resources tend to accept IEBT more than their counterparts with less resources. Therefore, the availability of financial resources tend to drive EC adoption in SMEs.

The relationship between EC adoption and firm performance

According to TOE framework, "the dependent variable can be adoption/ acceptance, receptivity, business performance, business value, or a combination of other relevant variables" (Ifinedo, 2011, p. 258). Following Ifinedo (2011, p. 259), the first dependent variable proposed in this paper is "adoption, which is operationalized with measures relating to frequency, extent of use, and criticality of the use of such technologies in business operation". Moreover, following Abebe (2014), the other dependent variable proposed in this paper is firm performance, which is operationalized with measures regarding "annual sales growth rate". Abebe (2014, p. 106) suggests that the annual sales growth rate is suitable for a study of the effect of EC on business performance in SMEs because one of the major benefits of EC adoption is the ability to attain higher sales volume from both existing and new customers. Likewise, EC-based firms have been reported to achieve high annual revenues, when compared to those companies that have not capitalized on the potential of EC (Yasin et al, 2014, p. 780). Accordingly, Abebe (2014) has proved that EC adoption has a positive impact on SME's annual sales growth rate and suggests that adopters of EC technology tend to have higher sales growth level than non-adopters. Therefore, the adoption of EC applications tend to improve firm performance in SMEs.

Conceptual framework

In order to develops a framework that integrates previous research findings, this paper reviews literatures relating to factors affecting EC adoption and its effect on firm performance and then builds on Tornatzky and Fleischer (1990)'s TOE framework (see Figure 1). TOE framework has been widely used as a basis model in inspecting EC acceptance. According to TOE framework, the adoption of EC is contingent upon organizational, environmental, and technological factors. This framework is consistent with Rogers' (1983) diffusion of innovation (DOI) theory as it emphases on both internal and external aspects of the organization, as well as technological aspects in a study of drivers for new technology dispersion (Ghobakhloo et al, 2011, p 1240). Chatzoglou and Chatzoudes (2016, p. 334) point out that TOE framework improve intra-firm innovation diffusion, so that it is more comprehensive than other models. Therefore, TOE framework is used in this paper as its validity is confirmed by the literature. Moreover, it is suitable with the context and objectives of the current study.

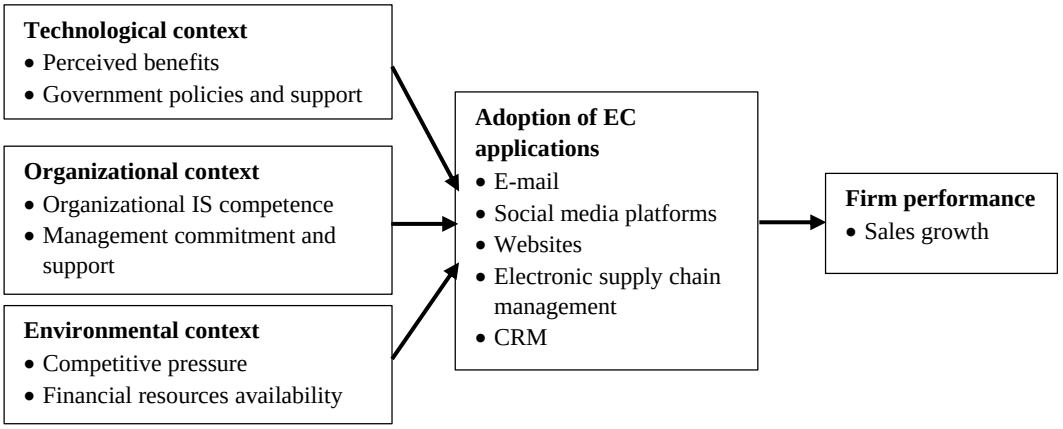

Figure 1 Conceptual framework

Methodology

A qualitative method was employed in this paper in order to gain a rich understanding from the participants' own perspectives. The interview technique was used to collect data from nine CEOs or managers of SMEs who adopt EC

applications to support their business operations. This paper provides a more holistic understanding which covers a wider variety of cases in SME context in order to build greater depth and richness into the knowledge base. A sample of firms were the members of Thai Chamber of Commerce and located in Bangkok and the metropolitan areas. They were invited by telephone to participate in the interview. The respondents' information are presented in table 1. Semi-structured questions were used as an instrument for the interview. The interviews took approximately 30 to 60 minutes. Data collected through interviews were recorded through hand-written notes and tape recordings. Content analysis was employed to identifying patterns in the interview data and grouping the data by themes and phases (Apulu et al., 2011).

Table 1 Respondent information

Description	No. of participants	%
Gender of respondent		
Male	8	88.89
Female	1	11.11
Position of respondents		
Managing director (MD)	4	44.45
Deputy MD	1	11.11
Senior officer (product development)	1	11.11
General manager (GM)	1	11.11
Manager (sales and marketing)	1	11.11
Manager (planning and policy)	1	11.11
Industry		
Sport equipment, stationary and office Supplies	2	22.23
Plastic	1	11.11
Food, vegetables and fruits processing	3	33.33
Restaurant	1	11.11
Auto parts	1	11.11

Reliability and validity of this study can be tested through different approaches. Generalizability is one of the measures for the validity of qualitative research depending on the case selected and examined (Patton, 2002). In this study, purposeful sampling was utilized for the identification and selection of information-rich informants related to the studied phenomenon (Patton, 2002). This ensures that participants are mostly knowledgeable about or experienced with a subject of interest (Cresswell and Plano Clark, 2011). Moreover, the rigor of qualitative methods usually depend on criterion for determining number of respondents based on type of analysis proposed. This study focuses on saturation (i.e., gaining a comprehensive understanding by continuing to sample until no new substantive information is acquired) (Palinkas et al, 2015), thereby collecting data from nine interviewees can achieve breadth of understanding and aims of the study. Saturation is determined a priori on the basis of an existing theory or conceptual framework (Palinkas et al, 2015). For data extraction and analysis, the respondent verification was adopted in this study to increase validity of the research processes. The interview transcripts and data analysis were sent to participants for approval the clarification of the research and thereby improving the quality of the research (Leung, 2015).

Result and discussion

Interviewees were asked to state EC applications adopted in their operations and the reasons behind their decision to adopt EC. The findings showed that SMEs have adopted EC because it offers a good opportunity to improve their business processes and performance. A wide range of EC operation modes adopted by SMEs were grouped into categories according to the extensive study on the operation modes of EC implementation (Khuong and Krachang, 2005). The operation modes of EC are presented in table 2 and table 3 presents the adoption of EC applications in SMEs.

Table 2 E-commerce operation modes

	Brand awareness	Cost saving	Promotion & advertising	Transaction	Information providing	Customer relationship	Process Improvement
1. Wattana Intergroup Co., Ltd.				√	√		√
2. Siam Victor Corp. Co., Ltd.	√	√	√	√	√	√	√
3. GTECH OHM Co., Ltd.	√	√	√		√	√	√
4. Sweet Bee Farm Co., Ltd.	√	√	√		√		√
5. Han-Ta-Dindang Restaurant	√		√		√		√
6. The Cap car Company	√	√	√	√	√		
7. Flugel Co., Ltd.	√	√	√	√	√	√	
8. Erawan Food Co., Ltd.	√	√	√		√	√	√
9. Seth Intertrade Co., Ltd.	√		√		√		

Table 3 Adoption of e-commerce applications

	E-mail	**E-SCM**	**Social media**	**Website**	**CRM**
1. Wattana Intergroup Co., Ltd.				√	
2. Siam Victor Corp. Co., Ltd.	√	√	√ (FB, Line, Twitter, YouTube)	√	
3. GTECH OHM Co., Ltd.	√	√	√ (FB, Line)	√	√
4. Sweet Bee Farm Co., Ltd.		√	√ (FB)	√	
5. Han-Ta-Dindang Restaurant			√ (FB, Line, YouTube)	√	
6. The Cap car Company			√ (FB, YouTube)		
7. Flugel Co., Ltd.			√ (FB, Instagram, Line)	√	√
8. Erawan Food Co., Ltd.	√	√	√ (FB, Line)	√	
9. Seth Intertrade Co., Ltd.	√		√ (FB, Instagram)	√	

E-commerce operation modes

Brand awareness/image building. The results showed that most of SMEs implement this mode to provide detailed information about the firm and its offerings to their customers. Rich messages with text, audio, and video play the significant role in attracting potential customers and creating a better customer experience (Laudon and Laudon, 2014). Social media platforms such as Facebook, Line, Instagram, and YouTube are their primary modes of communication. One respondent stated that:

We create video content – e.g. cooking information to demonstrate cooking techniques – in our news feed in order to increase our presence on Facebook. Facebook video is a great way to increase the audience's attention, reach and engagement.

A two-way conversation is a dialogue, where brands speak and listen to their customers, responding promptly to their needs and wants (Edgecomb, 2017; Newman, 2016). Four respondents said that:

A two-way conversation on social media, particularly Facebook and Line helps us directly connect brands and consumers (especially aged 25 – 34 years old). It supports us to know our customers' expectations and satisfaction, thereby improving our customer service and then improving brand royalty.

Therefore, the results support the study's findings of Öztamur and Karakadılar (2014, p. 513) suggesting that social media applications are the effective tools in building brand awareness and enhancing brand reputation than generating leads and increasing sales.

Cost saving. The findings revealed that most of SMEs adopt EC applications such as e-mail, electronic supply chain management (E-SCM) and website, with an aim to reduce the costs of the administration of the invoice to clients and the printing brochures. One respondent stated that:

We create digital brochures instead of printed leaflets as an alternative way for offering our customers to access the same information. Online brochures help us cut down on the amount we need to get printed. Printed advertising materials are costly, especially when they need to be updated.

E-SCM is derived from the development of supply chain with the utilization of the information technologies and Internet (Tan and Trang, 2017). It facilitates the greater exchange of information between the companies in the supply chain, and the companies can take advantages of a firm's internal and external linkages in order to eliminating duplication and errors of different logistics activities, reducing the level of paperwork and lowering inventory levels (Barutcu and Tunca, 2012, p. 1050). Two respondents stated that:

E-SCM helps to exchange of data on goods and inventories, and support efficient coordination and collaboration (e.g. sales promotions) across the whole organization. Establishing a single point of information and centrally managing data can accelerate processes, save time, and reduce back office staff costs. Especially, we can exchange data of our products, monitor inventories, and manage changes to the product assortment.

Therefore, the firms that implement E-SCM can reduce operating costs, improve productivity and then increase revenue.

In addition, the online advertising in social networks are more cost effective than the traditional marketing tools. The respondents indicated that social media platforms are the main focus on online advertising and marketing because the traditional platforms, particularly television, newspapers or other platforms are expensive and some companies cannot afford such expenses. One respondent stated that:

Social media is less expensive than other types of marketing – especially offline channels, like newspaper, radio and television – and it can easily be used to control our marketing programs – for example, when we shares updated content and sales promotion with fans on Facebook.

Therefore, SMEs are more appropriate to utilize social media platforms because of their higher need to cover marketing communications expenditures (Öztamur and Karakadılar, 2014).

Promotion & advertising. The findings discovered that e-mail and social media platforms such as Facebook, Line, Twitter, YouTube, and Instagram are used among SMEs as a marketing strategy tool to reaching prospects and customers, promoting their products/services locally and internationally and creating value for customers. The companies that emphasize on their social media platforms tend to concern the number of likes, the frequency of update, richness of the content and interaction of engagement (Öztamur and Karakadılar, 2014). One respondent stated that:

We update our Facebook page every day and post more than one content which are rich and related text, audio, and video – so that interaction of the engagement with customers is indeed effective. At the same time, we respond almost every inquiry and comment of the customers as well as the product reviews by the customers are shared and posted.

In addition, social media marketing campaigns are also viewed as good means of attracting new customers. One respondent stated that:

We attempt to attract our followers with promotions, contests, giveaways or other offers – then once we have a good following we can focus on more personalized social media marketing promotions to inspire and retain them.

On the other hand, e-mail is rarely utilized to send a new product release and promotion campaigns to their existing mailing list because consumers feel less acceptable for companies to send them promotional messages via e-mail. However, e-mail is an appropriate marketing communications strategy and marketing tools for the exchange of products, services or information between businesses, rather than between businesses and consumers or end users. Three respondents stated that:

We use email only for informing our wholesalers, retailers and business partners (B2B) about our new products or services offerings.

Therefore, this study's findings suggested that the keys success in social media utilization are as follows: (1) the purpose of business being on social media, (2) understanding the demographics of several social media platforms as different platforms appeal to different audiences.

Business Transaction and information providing. According to the results, SMEs highly recognize the benefits of EC but they have not employed the full functionality of EC, particularly placing order via the website. Only a few of respondents develop their own website and use it to interact with their customers and to complete online transaction. The majority of them have their own websites only for providing the necessary information about the company, products/services, and contact details. Three respondents stated that:

The advantages of internet technologies cannot be fully exploited due to a lack of knowledge, experiences and skills of such technologies.

The findings are consistent with the research outcomes of Ueasangkomsate (2015) and UNCTAD (2013) indicating that EC implementation of SMEs is still not efficient and not convenient for marketplace. Most of them use the internet more to send mails, transfer files or gather information and less to develop services, processes, business automation and internal processing of business information and knowledge (Awa et al, 2015, p 144).

Building Customer relationship. The findings indicated that a few of SMEs implement this mode to build strong customer relationship through customer relationship management (CRM) program. CRM is a useful tool to provide related information to support companies in order to resolve support problems, encourage potential leads and deliver a unique brand experience (Richardson, 2017). One respondent stated that:

CRM facilitates greater business efficiency in the areas relating to more responsive customer service, better use of salespeople's time, closer measurement of product development cycles and marketing campaigns.

Also, another respondent mentioned that:

Senior executives can make better decisions with the use of automated reporting and dashboards. The companies believe that customer satisfaction is the most important factor to stay competitive.

The results support the argument of Ćoćkalo et al (2013, p. 219) stating that CRM utilization can improve organization's profits and become more competitive by satisfying the client's need and wants. However, many respondents have not adopted CRM system in their organization due to various reasons, including the costs of hardware and software and resources limitations (e.g. finance, staffs and time). One respondent mentioned that:

CRM system is not adopted because of insufficient resources to acquire the CRM system and lack of knowledge, skills and expertise to implement the system.

Another respondents stated that:

We have less understanding about CRM technologies and do not know how this approach should be cost-effectively employed.

The findings support the past research results indicating that SMEs do not adopt CRM in their business because massive investment is required in maintaining customer database (Ćoćkalo et al, 2013, p. 218).

Process Improvement. The findings showed that SMEs utilize website, E-SCM and CRM in order to improve their business operations. According to website, it is an effective tool for reaching a wider audience, particularly unreachable customers. One respondent stated that:

Website helps us easily expand business and allow for sales process automation and for sales to be converted at a much higher rate than traditional sales systems.

In addition, the implementation of E-SCM can make the companies more efficient and effective. The respondents indicated that E-SCM provides them a wide variety of capabilities, including (1) greater integration throughout the supply chain, (2) lower inventory level, (3) lower operational redundancy, (4) higher accurate shipment tracking to their customers, (5) better production planning and scheduling, (6) faster response to problems or errors, (7) better management of information through decision-support systems and (8) higher levels of quality and customer satisfaction.

Furthermore, the utilization of CRM has dramatically enhanced sales method. Two respondents mentioned that:

We have a better process of handling leads and nurturing those into meaningful opportunities and providing insight into the life cycle of our future and existing customers. Best of all, it reduces the time of manual procedures and a lot of calls and e-mails between departments.

Therefore, the findings support the previous studies results indicating that the alignment of website, E-SCM and CRM with business processes will help companies to increase their performance and competitive advantage such as customer loyalty and productivity improvement (Barutcu and Tunca, 2012; Tan and Trang, 2017).

The factors influencing EC adoption

The Interviewees were asked to explain what and how critical factors influencing their decisions to adopt EC applications in their business operations. The interview findings showed that technological, organizational, and environmental contexts impact EC adoption in SMEs.

Technological context

Perceived Benefits. According to the results, SMEs adopt EC because they believe that there are potential opportunities and advantages of EC for their businesses. The respondents provided a wide range of advantages of EC adoption, including lowering costs, increasing business and market knowledge, improving business processes, extending new markets, strengthening customer relationship, developing new products and services and increasing sales. Moreover, the respondents noted that EC allows them to compensate their traditional limitations such as resource constraints and size disadvantages as it increases opportunities to new market entry, particularly international markets, and expands production capacity without increasing costs and manpower. One respondent stated that:

EC help to expand markets both locally and internationally – with small capital investment.

Another respondents said that:

An online presence requires a full computerization of operational processes – such as check-out, billing and payment – thus reducing the number of employees required to manage the business. Therefore, we can increase productivity and reduce costs.

Therefore, this paper's findings support the previous studies' outcomes (e.g. Al-Bakri and Katsioloudes 2015; Ghobakhloo et al, 2011; Hajli and Sims, 2014; Ifinedo, 2011) demonstrating that the firms that are aware and understand of the benefits of EC tend to accept new technologies in their business operations.

Government Policies and Supports. The findings revealed that government policies and supports are significant motivators of EC technologies adoption in SMEs. Importantly, the respondents pointed out that the governmental supports help eliminate the barriers to EC adoption in terms of resources shortage and insufficient IS knowledge and skills. Two respondents stated that:

The government's support programs – such as funding, training courses and

workshops relating to online business for SMEs (i.e., OSMEP, DIP etc.) inspire them to recognize the advantages of EC (i.e., productivity and competitiveness improvement) and result in accepting innovation technologies in their business operations.

Furthermore, the respondents suggested that the government's policies, subsidies and support infrastructures will develop the e-readiness (e.g. quality of ICT infrastructure, reasonable prices of software for SMEs etc.) in the country. The results corroborate the research findings of OECD (2017, p. 12) stating that "the development of an efficient ICT infrastructure, as well as enhanced interoperability and standards, are also increasingly important to access global markets, as they facilitate information exchange and communication as well as participation in EC platforms". One respondent mentioned that:

The government should develop software, particular for SMEs because software used by large companies are too expensive for SMEs to afford.

Therefore, the findings support the prior studies' outcomes (e.g. Awa et al, 2015; Chatzoglou and Chatzoudes, 2016; Durbhakula and Kim's study, 2011; Li and Xie, 2012) demonstrating that the government's policies and supports tend to motivate SMEs' intent and interest in accepting and implement EC in their business operations.

Organizational context

Organizational IS competence. The findings discovered that managers' knowledge and awareness of EC systems as well as the IT skills of company's members impact the adoption of EC systems. However, the respondents stated that they still cannot fully exploit the advantages of internet technologies due to a lack of knowledge, experiences and skills of such technologies. One respondent said that:

We are reluctant to adopt EC technology due to our limited financial resources and lack of technical know-how.

On the other hand, one respondent stated that:

Since we lack sufficient knowledge of IT and e-business, so we decide to use the service of leading online marketplace such as Lazada in order to overcome our limitations.

Therefore, the results support the past studies' findings (e.g. Al-Bakri and Katsioloudes, 2015; Ghobakhloo et al, 2011; Hajli and Sims, 2014; Ifinedo, 2011) signifying that SMEs implement EC systems successfully where their executives and employees have sufficient IS skills and expertise.

Management commitment and Support. The findings specified that management commitment and support can promote the innovation technologies acceptance in SMEs. Two respondents stated that:

Top managers motivate other organizational members to accept Internet technologies when they

recognize the significant of EC technologies for their business operation improvement and competitive advantage achievement.

Moreover, three respondents mentioned that:

Top managers help to remove barriers relating to a lack of sufficient IS skills and expertise of organizational members by sending them to certain training courses and workshops (e.g. online content creation, social media marketing, online advertising and promotion, website development).

Therefore, the results support the previous researches' outcomes (e.g. Chatzoglou and Chatzoudes, 2016; Ghobakhloo et al, 2011; Ifinedo, 2011) suggesting that management commitment and support stimulate SMEs to adopt and implement EC systems.

Environmental context

***Competitive Pressure*.** The findings indicated that SMEs use EC strategies in order to stay competitive and innovative as an essential for their survival and business growth. All respondents pointed out that EC is a source for organizational competitive advantage for today's business environment. One respondent said that:

EC is employed as a new innovation strategy to offset resource limitations (i.e., financial and human resources) and size disadvantages (i.e., customer reach and production costs) – as it assists in lowering costs and expanding geographical reach.

Likewise, another respondent mentioned that:

The use of Facebook is an effective marketing channel for reaching out new customers and new demographics (e.g. Laos) and exposing the business to new partners (e.g. increased numbers of distributors).

Therefore, the results corroborate the past researches' findings (e.g. Al-Bakri and Katsioloudes, 2015; Chatzoglou and Chatzoudes, 2016; Ifinedo, 2011; Ghobakhloo et al, 2011) suggesting that an environment of fierce competitive challenge tends to influence EC adoption and implementation in SMEs.

***Financial Resources Availability*.** The findings showed that SMEs with better financial assets tend to accept EC more than counterparts with less resources. Two respondents mentioned that:

We adopt EC because we are able to invest in new technologies and pay for EC implementation expenses and ongoing expenses (e.g. communications charges and usage fees). We believe that investing in EC platform is important for all business in order to enhance competitiveness.

Conversely, one respondent stated that:

Although we recognize the benefits of EC, engaging in the full functionality of EC may increase overall costs. We have to make expenditures on technology

devices, communications support, and product or service support (e.g. delivery, on-line payment and certified security). Therefore, we are reluctant to adopt such technology due to our limited financial resources and lack of technical know-how.

Therefore, the results support the past studies' outcomes (e.g. Al-Bakri and Katsioloudes, 2015; Ifinedo, 2011; Li et al, 2010; Yoshino and Taghizadeh-Hesary, 2016) suggesting that the availabilities of financial resources and support tend to drive EC adoption in SMEs.

The consequences of EC adoption on firm performance

In this section, the interviewees were asked to describe whether and/or how EC adoption impact on their firm performance. The findings revealed that SMEs that adopt EC in response to environmental challenges can enhance their business performance. The respondents indicated that EC helps the companies to increase productivity, improve higher levels of quality, and enhance customer satisfaction, thereby increasing sales and profits. One respondent stated that:

Line application is used for two-way communication channel within the company. It provides an open channel for employee feedback, inspiring them to share ideas and suggestions for improving productivity within the company. By doing so, we provide mobile Internet devices (i.e. smartphones) to our employees as a way to be connected between different departments in a company, improve productivity, and enhance customer services and may result in increased sales and profits.

In addition, the respondents suggested that the EC is an effective tool in generating leads and increasing sales by satisfying the customer's needs and wants. One respondent mentioned that:

The utilization of EC can boost sales by 10 – 20% from both existing and new customers. It is an effective channel to extending market reach, delivering a unique brand experience and increasing customer satisfaction.

Likewise, another respondent stated that:

The use of EC improve our sales (e.g. increased the order size and the number of online customers). The Internet technology improve inventory management and customer service offerings by providing another platform on which customers can reach out with complaints and questions – thereby lowering costs and increasing customer satisfaction and profits.

Another respondent mentioned that:

The use of Facebook and the service of leading food delivery application such as Lineman can increase sales by 10%. The technologies allow us to learn about our customers' needs, wants, and habits, increase traffic to our site and boost sales.

Therefore, the results support the past studies' outcomes (e.g. Abebe, 2014; Yasin et al, 2014) suggesting that EC adoption significantly improves firm performance, particularly annual sales growth rate.

Conclusions

This paper aims to investigate the important determinants of EC adoption and its effects on firm performance in SMEs. Specifically, three main factors driving SMEs' endeavors in EC acceptance are highlighted, including organizational, environmental, and technological elements. The framework developed by this paper offers a conceptual foundation for further empirical study. It also provides insights into what significant factors motivating SMEs' EC adoption and how such EC adoption improves business performance. According to the determinants of EC adoption, all factors comprising organizational, environmental, and technological components significantly influence SMEs to adopt EC systems. Moreover, the adoption of EC applications tend to improve firm performance, particularly sales growth rate. Furthermore, this paper contributes to some important recommendations, both for practitioners and for future research in this subject of concerns.

Implications

Implications for research

This papers offers some theoretical contributions. First, the conceptual framework in this paper is built upon the previous studies but is different in an integrative approach. This paper intends to address factors influencing the adoption of EC within SMEs. Accordingly, it supports the suitability of the TOE framework as a practical model for explaining the adoption of EC in SMEs in developing countries. Second, the "adoption" proposed in this paper is different from prior studies that incline to operationalize such constructs with a single item of "use" (usage) or intention to use. The employment of such single item may mislead the reality and has been criticized for limiting understandings (Ifinedo, 2011). Third, this paper not only proposes the determinant factors of EC adoption but also its impacts on firm performance in the single framework. Consequently, this would gain a holistic knowledge of the subject under investigation. Therefore, this paper provides valuable insights into the literature with its viewpoints of the EC adoption topic in the SME context, which practitioners in similar settings may find useful.

Implications for practice

This paper provides some recommendations for government

agencies and SMEs. Government agencies play a key role in supporting EC adoption in SMEs, especially in developing countries like Thailand. The widespread use of EC is a necessity for survival and growth of SMEs. Accordingly, the government agencies need to promote the attitude and innovativeness of owners/managers through improving their understanding and perception toward EC adoption (e.g. training programs, workshops and coaching). The higher level of awareness towards EC benefits of CEOs, the more likely their receptiveness of EC usages will be enhanced. Moreover, since EC adoption cost is a major barrier for EC adoption within SMEs, financial incentives and supports provided by the government for EC development would significantly improve e-readiness of SMEs. SMEs with sufficient financial resources would consider to invest in the adoption of EC applications as a feasible project to enhance their business operations. Accordingly, this paper suggests that policy makers play a vital role in promoting EC successfully among SMEs in developing countries, particularly Thailand. Therefore, EC-friendly policies should be developed and implemented to remove obstacles concerning financial, legal, and physical infrastructures for the improvement of EC in businesses across the whole country.

In order to survive and stay competitive in the highly changeable business environment, SMEs' owners and managers need to understand and have positive attitudes towards the benefits of EC adoption. The deployment of EC technologies, particularly interactive website and social media platforms (i.e., Facebook, Line, and YouTube) can help SMEs to compensate their resource constraints in order to reduce costs, develop markets, improve business processes and customer satisfaction, and enhance communications and coordination both internally and externally. However, SMEs should determine which online platform is right for the targeted audiences, and consider which one will help them meet their marketing purposes. For example, for companies whose target customer is aged 25 – 34 years old, the most effective use may be Facebook and website in order to have a presence, provide contact information, and use it strictly for their robust advertising campaigns. They can learn about the needs, wants, and habits of their audience and customers and thereby increasing traffic to their site and boosting sales. In addition, top executives and business owners need to utilize the full benefits of EC adoption in order to improve services, processes, and business automation. Furthermore, the managers should commit and support necessary resources to adopt and use EC applications and must invest in activities that develop their technological readiness, especially knowledge and skills of IT and e-business for managers and organizational members in order to build a compatible business structure

prompt to accept and use innovative IT systems.

Limitations and future research

This paper has some limitations. First, this paper aims to propose a theoretical model of the determinants of EC adoption and its effects on firm performance and empirically test the model. The theoretical model proposed in this paper can be further studied in Thailand and in other developing countries with comparable analyses to deepen knowledge in this subject of study (Ifinedo, 2011). Second, this paper focuses only on the enabler factors of EC adoption and those enables may not guarantee the initiate of EC adoption within SMEs. The barriers to the use of EC in SMEs is needed for the future research in order to ensure content validity (Hajli and Sims, 2014). Third, the theoretical framework of this paper emphasizes only on SMEs, thus it could be used to study the effects of similar factors in larger companies in Thailand. Moreover, future studies employing meta-analytic methods could inspect the enablers and inhibitors of EC adoption in SMEs in comparable measures of the developed countries (Ifinedo, 2011). Finally, future studies should examine whether other factors (e.g. perceived compatibility, consumer readiness, support from IS vendor, information intensity, supplier/customer pressure, adoption cost, etc.) impact EC adoption in SMEs.

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