

DEVELOPING A CONCEPTUAL FRAMEWORK TO EVALUATE PUBLIC B2B E-MARKETPLACES

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Abstract

Business-to-business (B2B) e-marketplaces are Internet-based inter-organizational trading platforms that facilitate and foster the exchange of information, products and services, and other business transactions among many buyers and sellers. Despite the proliferation of B2B e-marketplaces, many B2B e-marketplaces have failed. A well-developed framework or standard for evaluating B2B e-marketplaces is scarce in the literature. Previous studies indicate the need for a comprehensive evaluation framework for evaluating performance of B2B e-marketplaces. This research presented a framework to evaluate performance of public B2B e-marketplaces that support small exporters. Factors contributing to the performance and effectiveness of B2B e-marketplaces were explored. The proposed conceptual framework integrated factors from both B2B e-marketplace performance and Web site evaluation perspectives. Expert interviews using a semi-structured approach were conducted in order to verify the proposed conceptual framework. On the basis of thorough review of literature and expert interviews conducted, this study proposed eleven factors to evaluate public B2B e-marketplaces. This research contributes to the literature by building an integrated framework to evaluate the performance public B2B e-marketplaces. It also contributes to the B2B e-marketplace industry by offering a practical mean for public B2B e-marketplace market makers or managers to evaluate and improve their e-marketplaces.

1 INTRODUCTION

A revolution in the Internet and communication technologies has been changing the way people conduct businesses. The Internet, the World Wide Web (Web), and mobile technologies fundamentally drive the development of e-commerce, a key driver of the present and future of commerce worldwide. E-commerce is a global phenomenon, bringing about enormous and unprecedented changes to our personal lives, business firms, markets, industries, and society throughout the world. There are many types of e-commerce. Business-to-business (B2B) e-commerce is the largest form of e-commerce (Laudon & Traver 2013).

Business-to-business (B2B) e-commerce refers to transactions between business firms (i.e., businesses sell to other businesses) conducted electronically over the Internet. In 2013, B2B e-commerce revenues worldwide are about \$12.4 trillion, whereas business-to-consumer (B2C), in which online businesses sell to individual consumers, revenues worldwide are about \$1.2 trillion. One of the key components that drives the success of B2B e-commerce is a virtually central trading space for business traders, called a B2B e-marketplace (Laudon & Traver 2013; Turban et al. 2008).

B2B e-marketplaces are Internet-based inter-organizational trading platforms that facilitate and foster the exchange of information, products and services, and other business transactions among many buyers and sellers. Thus, the e-marketplaces serve as intermediaries in B2B e-commerce. B2B e-marketplaces are normally classified into three types: public e-marketplaces owned and run by independent third-party, consortium e-marketplaces formed by a group of major industry players, and private e-marketplaces owned by a single leading player in an industry in order to facilitate their own selling and/or purchasing activities (Wang et al. 2012; Turban et al. 2008). This study focuses on public B2B e-marketplaces because previous research indicated that there is a scarcity of research on public B2B e-marketplaces (Wang et al. 2012). Alibaba.com, the largest B2B e-marketplace in China and one of the most famous B2B e-marketplaces in the world, is an example of public B2B e-marketplaces.

With the proliferation of B2B e-marketplaces, many B2B e-marketplaces succeed, while many others have not survived. One of the major factors influencing the failures is the difficulty in evaluating the performance of B2B e-marketplaces (Matook 2013; O'Reilly & Finnegan 2005; Buyukozkan 2004). In addition, one of possible reasons to explain those failures can be from competition perspective. Standing et al. (2006) applied Porter's Competitive Forces Model to explain B2B e-marketplace structures and strategy, and stated that the most important factor influencing an e-marketplace's profitability is "the intrinsic power of the buyers and sellers in the product area." The previous studies indicated that there is a limitation of knowledge on a coherent theory of B2B e-marketplace performance and evaluation. A well-developed or standard framework for evaluating B2B e-marketplace is scarce in the literature (Matook 2013; Wang 2012). In order to optimize B2B e-marketplaces and maintain competitive advantage, the evaluation of performance of the e-marketplaces is necessary. The effective B2B e-marketplaces will benefit all stakeholders in particular and the global e-commerce as a whole. There is a need for the comprehensive evaluation framework for assessing performance of B2B e-marketplaces.

This research aims to fill the gap in the literature by exploring factors contributing to the performance and effectiveness of public B2B e-marketplaces. The main purpose of this study is to develop an integrated framework to evaluate the performance of public B2B e-marketplaces that support small exporters. A key research question that motivates this study is - what are important factors and related measures that contribute to the performance of public B2B e-marketplaces? The results of this study are expected to provide benefits to both academic research and the B2B e-marketplaces industry, by building a framework for evaluating public B2B e-marketplaces, and by offering a practical mean for public B2B e-marketplace market makers to evaluate and improve their e-marketplaces, respectively.

2 LITERATURE REVIEW

Public B2B e-marketplaces are web-based systems; therefore, this study investigated the literature relevant to B2B e-marketplace performance and Web site evaluation perspectives. This section provides background and literature to gain a better understanding of B2B e-marketplace evaluation.

2.1 B2B e-Marketplaces

A public B2B e-marketplace, the focus of this study, is generally a Web-based information system that allows many buyers and many sellers to electronically meet and conduct their businesses. The key stakeholders of a public B2B e-marketplace consist of B2B e-marketplace market makers or operators who own and operate the e-marketplace, sellers, and buyers. B2B e-marketplaces generally provide both platforms and a variety of online services to participants (Turban et al. 2008; Fairchild et al. 2004).

According to Turban et al. (2008), e-marketplaces have three main functions: aggregating and matching buyers and seller, facilitating transactions, and maintaining an institutional infrastructure. Brunn et al. (2002) stated that functionality of B2B e-marketplaces can be classified into three main groups: commerce, content, and collaboration. Commerce focuses on facilitating transactions between buyers and suppliers. Catalog, auction, and exchange are examples of important commerce models of B2B e-marketplaces. Content is the core element of B2B e-marketplaces. Commerce content refers to the actual product and service offerings and their relevant information required to support purchasing decision, such as product-related information and pricing information. Collaboration focuses on collaboration tools which connect trading participants and third parties in order to satisfy their specific needs. Furthermore, B2B e-marketplaces also provide value-added services such as financial and logistics services in order to fulfill participants' needs (Janita & Miranda 2013; O'Reilly & Finnegan 2005). B2B e-marketplaces provide different functionalities depending on their business models and objectives.

One of the main objectives of B2B e-marketplaces is to eliminate inefficiency within the industry (Buyukozkan 2004; Barratt & Rosdahl 2002). Another objective is to improve adoption and implementation of e-commerce by small and medium enterprises (SMEs) (Standing et al. 2006). According to economic theory, the key benefit of B2B e-marketplaces is market efficiency accomplished through market aggregation. Market aggregation overcomes market fragmentation, thus offering buyers more information and choices on products and sellers, affording sellers with wider market access, and both with lower transaction cost as well as price transparency (Rao et al. 2007; Le et al. 2004).

Despite many benefits B2B e-marketplaces can bring to firms and industries, many B2B e-marketplaces have failed. Existing studies indicate a need for a better understanding of performance and success of B2B e-marketplaces, especially public B2B e-marketplaces (Matook 2013; Wang 2012). They call for more research on a comprehensive evaluation framework for assessing performance of B2B e-marketplaces.

2.2 Performance of B2B e-Marketplaces

The performance of B2B e-marketplaces is defined in different ways. O' Reilly and Finnegan (2009, p.154) defined e-marketplace performance as "the extent to which the electronic marketplace provides and improves value for its owners, how efficient it is in performing its tasks and meeting its objectives, while continuing to innovate, grow and expand." Buyukozkan (2004, p.762) defined e-marketplace performance as "the efficiency and effectiveness of actions of an e-marketplace." It can be concluded that both definitions shared a common characteristic of performance: goals or objectives have to be achieved in order to achieve good performance. The reliable and valid information about B2B e-marketplace performance is very important because it allows a B2B e-marketplace to determine its success, compare its performance with other e-marketplaces, and identify the areas for improvement (Matook 2013; Arzu Akyuz & Erman Erkan 2010). Factors that are critical to performance or success of B2B e-marketplaces have been investigated and proposed in the literature.

Johnson (2013) used a strategic fit perspective to identify critical success factors (CSFs) of B2B e-marketplaces in the aerospace, healthcare, higher education and local government industry sectors. The study identified eight factors: critical mass, integration, value proposition, leadership participation, industry knowledge, revenue model, branding and reputation, and rich content. The study concluded that the findings of the study provided a "snapshot" of CSFs of e-marketplaces at a specific time frame; therefore, the CSFs should be modified and refined in various ways over time.

Matook (2013) introduced the use of goal-based approach to determining the performance of B2B e-marketplaces. The degree to which pre-define goals of an e-marketplace are achieved is used to measure the ongoing and long-term performance of the e-marketplace. The study identified 16 strategic goals to measure the performance of B2B e-marketplaces: profit, growth, sustainability, number of buyers, transaction volume, transaction cost, the number of transaction, transaction quality, customer service, awareness level, customer satisfaction, customer loyalty, accessibility, user friendliness, software quality, and infrastructure quality. The findings highlighted the utility and value of strategic goals to measure the performance of e-marketplaces. Matook (2013) called for more in-depth studies in measuring performance of B2B e-marketplaces.

Janita and Miranda (2013) conducted an empirical study to explore service quality dimensions of B2B e-marketplaces in the construction sector in Spain. The study identified four key B2B service quality dimensions from a seller's perspective: reliability and privacy, utility of the information, value-added services, and Web site efficiency. The findings showed that these service quality dimensions have impacts on customer loyalty.

Wang et al. (2012) used organizational capability and market opportunity theories to study factors influencing the performance B2B e-marketplaces. The findings of empirical study indicated four factors leading to the success of e-marketplaces: market size, service width, e-commerce awareness, and human resource capabilities. This model did not consider technical factors as its performance measurements, which may be seen as the weakness of this study. The study called for future research that provides a more comprehensive and refined understanding of B2B e-marketplace performance.

The previous studies have identified a number of factors influencing the performance and success of B2B e-marketplaces. Different approaches and theories have been used to explain the performance and success of B2B e-marketplaces. Most studies explored the performance of B2B e-marketplaces from the e-marketplace market maker's perspective. Research calls for a more comprehensive and refined understanding of measuring performance of B2B e-marketplaces. This study investigated the factors for evaluating performance of public B2B e-marketplaces from both the market maker's and seller's perspectives in order to capture the viewpoints of both providers and users of the B2B e-marketplaces.

2.3 Web Site Evaluation

A Web site is a gateway and primary infrastructure of a public B2B e-marketplace. Web site performance and effectiveness affect customer satisfaction and influence purchase decisions (Bai et al. 2008; Loiacono et al. 2007). Web site evaluation provides businesses useful information to improve strategies and operations (Lee & Morrison 2010). Existing studies have proposed diverse Web site evaluation approaches. However, there is no universally accepted approach or standard for evaluating Web sites (Salavati & Hashim 2015; Chiou et al. 2010). Furthermore, different researchers use different terms to evaluate Web sites. Following Chiou et al. (2010, p.283), a factor is defined as "the set of relevant criteria", and a criterion is defined as "a specific item or variable, such as loading speed, search capability, and up-to-date information." Extensive factors and criteria for evaluating Web site effectiveness have long been investigated and proposed in various contexts in the literature.

Fernández-Cavia et al. (2014) developed an assessment system for evaluating official tourist destination websites. A Web Quality Index (WQI), consisted of twelve parameters, was used as the evaluation framework. Examples of the parameters are usability and accessibility, home page, content, information architecture, and content amount and quality.

Dickinger and Stangl (2013) suggested formative measurement approach for website performance. The results showed important website performance dimensions which include content quality and usefulness followed by ease of use and website design. Trust and system availability were found to have less impacts on website performance than the aforementioned items.

Chiou et al. (2010) reviewed and analyzed 83 articles related to Web site evaluation to identify the trend of Web site evaluation. They identified three approaches commonly used to evaluate Web sites: information system (IS), marketing, and combined approaches. The study classified twelve unified factors commonly used in three Web site evaluation approaches. The top five most frequently used

factors are ease of use, information quality, responsiveness, visual appearance, and security/privacy respectively. The study introduced a strategic evaluation framework and a five-stage evaluation process for website evaluation. It suggested that evaluating Web site should be performed according to a better understanding of the target Web site's strategies.

Loiacono et al. (2007) conducted a large-scale survey research to develop the WebQual instrument for consumer evaluation of Web sites. WebQual includes twelve dimensions: informational fit-to-task, tailored information, trust, response time, ease of understanding, intuitive operations, visual appeal, innovativeness, emotional appeal, consistent image, on-line completeness, and relative advantage. The study concluded that WebQual is not the final measurement instrument for Web sites. It should be modified and refined in order to enhance its applicability.

Based on the above discussion, it can be clearly seen that diverse Web site evaluation approaches, factors, and criteria have been used in Web site evaluation depending on objectives, strategies, and contexts of Web sites. In particular, there is little Web site evaluation framework for B2B e-marketplaces. This study focuses on Web site evaluation in B2B e-marketplace context.

3 PROPOSED CONCEPTUAL FRAMEWORK

A proposed conceptual framework was developed and proposed based on the existing studies. The framework integrated factors from the performance of B2B e-marketplaces and Web site evaluation perspectives. Figure 1 presents the proposed conceptual framework of this study. Eighteen related factors of those perspectives were identified and classified into five views. The four views, namely the business view, the transaction view, the market service view, and the infrastructure view, are the four board perspectives of e-marketplaces. They are the core structures of the reference model for electronic markets (RM-EM), developed by Schmid and Lindemann (1998). The previous studies have used it to address the analysis and design of electronic markets-related issues (Matook 2013; Matook & Vessey 2008; Stanoevska-Slabeva & Schmid 2000). Matook (2008) tailored the RM-EM to B2B e-marketplace domain and developed a domain-specific model for e-marketplaces. The domain-specific model for e-marketplaces was used as the foundation for a study of classification of B2B e-marketplaces.

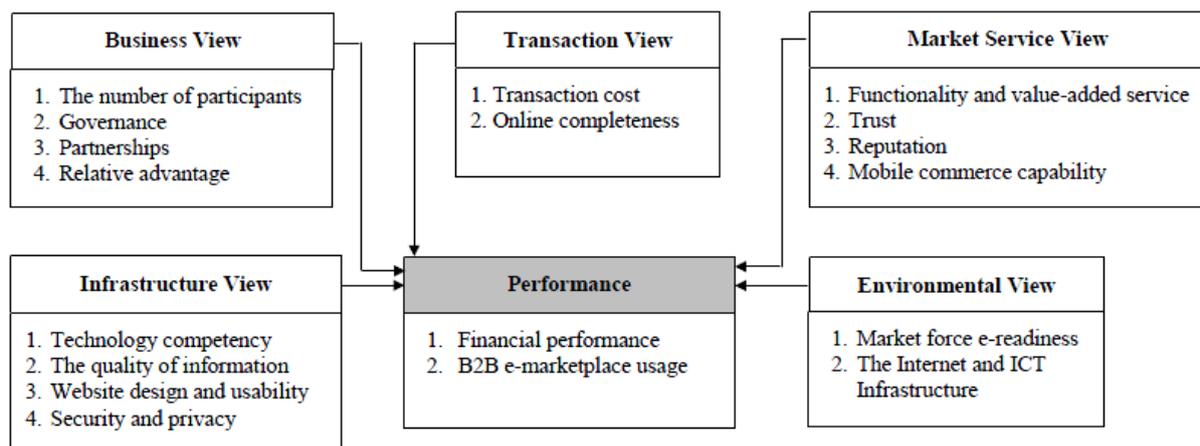


Figure 1. The proposed conceptual framework for evaluating public B2B e-marketplaces

This study used the four views of the reference model for electronic markets to provide a structure for factors in the proposed conceptual framework because it addresses the domain of electronic markets and provides an integrative perspective which covers all essential aspects of electronic markets. In addition, this study added an additional view, namely the environmental view, into the framework because it can provide a complete picture of a framework to evaluate public B2B e-marketplaces. Consequently, the proposed conceptual framework consisting of 18 factors mapping into five views was developed to determine the performance of public B2B e-marketplaces. The operational definitions and importance of the proposed constructs are highlighted below.

3.1 The Business View

The business view captures the purposes of a B2B e-marketplace, roles and responsibilities of the e-marketplace's participants, and rules coordinating the activities of the e-marketplace with its business environment (Matook 2008). Four evaluating factors were mapped into this view:

3.1.1 The Number of Participants

The number of participants refers to the number of buyers and sellers participating in a B2B e-marketplace. A B2B e-marketplace's ability to attract and maintain a large number of actively trading buyers and suppliers is vital to its performance (Johnson 2013; Wang 2012). The large number of trading buyers and sellers will attract new buyers and seller to participate in an e-marketplace, which will lead to high volume of transactions (Johnson 2013; Stockdale & Standing 2003).

3.1.2 Governance

An e-marketplace is governed by guidelines and rules. They govern how an e-marketplace operates, what the requirements are to join, what fees are involved, etc. (Turban et al. 2008). According to Saprikis and Vlachopoulou (2012), buyers and suppliers agreement to a B2B e-marketplace's operational rules is vital for the e-marketplace success. The findings of their study indicated that operational rules positively influence suppliers' level of use of B2B e-marketplaces. Good management and effective operations and rules are critical to B2B e-marketplace success (Turban et. Al. 2008). Furthermore, Balocco et al. (2010) indicated that guaranteeing the neutrality of e-marketplaces in managing the transactions between buyers and suppliers is important to the success of B2B e-marketplaces.

3.1.3 Partnerships

Partnering with key industry leaders is a vital strategy in gaining competitive advantage and achieving a critical mass of participants and transaction volume. The participation of large industrial buyers and suppliers plays a pivotal role in B2B e-marketplace success because key industry leaders will attract many additional enterprises of various sizes to join a B2B e-marketplace (Johnson 2013). Brunn et al. (2002) and Lenz et al. (2002) stated that partnering with service providers, such as technological, financial and logistics services, is a key to being able to scale up quickly and to offering participants on a B2B e-marketplace a wide array of value-added services. Moreover, partnering with other e-marketplaces can also be beneficial because more products and service offerings can be offered to participants.

3.1.4 Relative Advantage

Lin (2008, p.63) defined relative advantage as "the degree to which using a particular system provides more benefits than its precursor." It is also referred to the degree to which using a particular system can bring benefits to a firm (El-Gohary 2012; Lin 2008). Studies indicated that if an innovation provides more benefits than old ones, the level of use of the innovation increases (Lin & Lin 2008; Lee & Kim 2007). Prior research indicated that B2B e-marketplaces provide advantages for both buyers and sellers. According to Turban et al. (2008) and Rao et al. (2007), potential advantages of public B2B e-marketplaces for sellers are reaching broader range of customers, accessing to global markets easily, and being new sales channel. Potential advantages of public B2B e-marketplaces for buyers are reaching a large number of sellers as well as product choices, and price transparency.

3.2 The Transaction View

The transaction view focuses on "harmonizing the business model with buyers and suppliers in the environment to enable e-commerce activities" (Matook 2008, p.263). Two evaluating factors were mapped into this view:

3.2.1 *Transaction Cost*

Transaction costs are costs associated with transaction processes in conducting business such as search cost and co-ordination costs (Standing et al. 2010). Bunduchi (2008) and Rao et al. (2007) indicated that e-marketplaces play an important role in reducing transaction cost for participants. By bringing a large number of sellers and buyers into a central marketplace, B2B e-marketplaces reduce search cost of trading partners for both seller and buyers (Luvsanbyamba & Chung 2011; Turban et al. 2008).

3.2.2 *Online Completeness*

Online completeness is described as the ability to complete necessary transactions online (Loiacono et al. 2007). An e-commerce Web site must support a consumer's desire to carry out a transaction online. (e.g., gathering information, bargaining, online purchasing and payment). Existing research indicated that on-line completeness is an important factor to consider when evaluating the quality of e-commerce Web sites and consumers' perceptions of Web sites. It ultimately influences consumer behavior, especially consumer intention to revisit or purchase (Loiacono et al. 2007; Kim & Stoel 2004).

3.3 **The Market Service View**

The market service view captures the communication and coordination services available to the B2B e-marketplaces' participants (Matook 2008). Four evaluating factors were mapped into this view:

3.3.1 *Functionality and Value-added Service*

One of the key functions of a B2B e-marketplace is to provide to its members the highest levels of functionalities and value-added services in order to help them streamline their business processes (Saprikis & Vlachopoulou 2012; Turban et al. 2008). Functionalities and value-added services are keys to B2B e-marketplace success (Buyukozan 2004; Brunn et al. 2002). O'Reilly and Finnegan (2005) indicated that the compatibility between value-added services offered by an e-marketplace and value needed by users is vital to B2B e-marketplace performance.

3.3.2 *Trust in B2B e-Marketplace Market Maker*

Trust in an e-marketplace market maker is defined as "the security one feels regarding the efforts of the intermediary to apply guarantees, regulations, safety nets or other structures effectively" (Hong & Cho 2011, p.470). Trust is the foundation of all types of e-commerce including business-to-business (B2B). Trust in an e-marketplace market maker influences buyers' trust in the community of sellers; and thus influencing buyers' purchase intention (Hong & Cho 2011; Verhagen et al. 2006).

3.3.3 *Reputation*

Company reputation is defined as "the extent to which users recognize a market-maker as famous and good" (Kim & Ahn 2005, p.196). Marketing and reputation play a vital role in attracting sellers and potential worldwide buyers to come to and used an e-marketplace (Kim & Ahn 2005). The company's reputation has a broader influence on perceptions of customer loyalty (Whetten & Mackey 2002).

3.3.4 *Mobile Commerce Capability*

Mobile commerce (m-commerce) refers to "any transaction, involving the transfer of ownership or rights to use goods and services, which is initiated and/or completed by using mobiles access to computer mediated networks with the help of mobile devices" (Raphaeli et al. 2014). M-commerce adds value to traditional e-commerce applications by offering always on, location-centric, convenience, customization, and identifiability (Akesson 2007). Due to the ever-increasing number of mobile Internet users globally and benefits of m-commerce, this study proposes that B2B e-marketplace should provide m-commerce services which offer full of useful functions and benefits and be accessed by most mobile platforms (e.g., iOS & Android).

3.4 The Infrastructure View

The infrastructure view focuses on the telecommunication infrastructure of B2B e-marketplaces, which enables business transactions and the implementation of market services (Matook 2008). Four evaluating factors were mapped into this view:

3.4.1 Technological Competency

To create a strong foundation for B2B e-marketplace performance, an e-marketplace must set up with the suitable technological platform by ensuring a sufficient technological competency level. The technological platform should be robust, reliable, and easy to use (Brunn et al. 2002; Buyukozan 2004).

3.4.2 The Quality of Information

The quality of information focuses on the quality of content of the Web site and suitability of the information for user's purpose (Johnson 2013; Loiacono et al. 2007). In e-commerce context, an e-marketplace must provide content rich Web site which fulfills traders' needs in conducting business. Useful information help traders make better informed purchases (Johnson 2013; Fairchild et al. 2004).

3.4.3 Web Site Usability

Web site usability refers to "ability of a Web site to engage in two-way communication with a visitor and make it easy to find needed information" (Chakraborty et al. 2005, p.424). It is also referred to the site's ease of use (Janita & Miranda 2013). Many studies emphasize the importance of Web site usability to Web site effectiveness (Chiou et al. 2010; Chakraborty et al. 2005). Husain et al. (2009) reviewed the past literatures and identified that usability is the most popular factor that have been used, for both quantitative and qualitative methods, to evaluate e-commerce sites.

3.4.4 Security and Privacy

Security and privacy refer to "the ability of a Web site to protect personal, financial, and transaction-related information of a user" (Chakraborty et al. 2002, p.63). Security and privacy of information and transactions are the major concern of online traders (Janita & Miranda 2013; Fairchild et al. 2004). Security-based mechanisms can help to maintain and improve the level of trust that participants have in e-marketplaces (O'Reilly & Finnegan 2005).

3.5 The Environmental View

The environmental view represents the current operating environment of B2B e-marketplaces. It captures the external factors that have impacts on the performance of public B2B e-marketplaces (Zhu & Kraemer 2005). Two evaluating factors were mapped into this view:

3.5.1 Market Forces e-Readiness

Market forces e-readiness refers to the application and use of e-commerce by a firm's competitors, customers, suppliers, and other business partners. Existing studies indicated that pressure from a business's market forces (suppliers, buyers, and other partners) have positive effects on an organization's utilization of e-commerce in developing countries as well as an organization's intention to continue to use B2B e-marketplace in China (Zhai 2010; Molla & Licker 2005). Hung et al. (2014) indicated that market force e-readiness has a significant positive influence on the degree of implementation of a corporate Web site by SMEs.

3.5.2 The Internet and ICT Infrastructure

Since the Internet is the primary infrastructure supporting B2B e-marketplace transactions and activities, the efficient national Internet and information and communication technology infrastructure (ICT) plays an important role in the performance of B2B e-marketplaces. Kenneth et al. (2012) described that availability of technology infrastructure of a country helps establishing a good

environment for implementation of e-commerce, and thus influences the adoption of e-commerce. Wong (2003) indicated that the efficient national Internet and ICT infrastructure influences e-commerce diffusion in Singapore.

3.6 Performance of B2B e-Marketplaces

Factors in each view are supposed to have an impact on the performance of public B2B e-marketplaces. Two performance factors were proposed:

3.6.1 Financial Performance

The previous studies have indicated that gains in financial performance are good measurements for the performance of B2B e-marketplaces. Johnson (2013) indicated that B2B e-marketplace success can be determined by its profitability and positive cash flow. Wang et al. (2012) used financial indicators, namely profit and revenue as performance measurements of B2B e-marketplaces. O'Reilly and Finnegan (2008) identified that revenue and profitability are key performance measures used by all B2B e-marketplaces in their study.

3.6.2 B2B e-Marketplace Usage

B2B e-marketplace usage is defined as the degree to which a B2B e-marketplace is used by buyers and sellers to conduct trade. The use of B2B e-marketplace is determined by the number and volume of transactions (Fairchild et al. 2004). Existing research indicated that the use of B2B e-marketplace is vital to B2B e-marketplace performance (Johnson, 2013; Fairchild et al. 2004).

4 RESEARCH METHODOLOGY

The proposed conceptual framework was developed on the basis of an extensive literature review. To identify factors for evaluating public B2B e-marketplaces, a review of the literature in B2B e-marketplace performance and Web site evaluation domains was conducted. This resulted in an initial pool of factors influencing the performance of B2B e-marketplaces. The candidate list of factors was then analyzed to eliminate repetitive items, merge similar items, and condense sub-attributes to higher level factors. Consequently, 18 high-ranking key factors identified in the previous studies were derived. They were then classified into five views which consist of the four views of the reference model for electronic markets, and the environmental view, and the performance of public B2B e-marketplaces. They were integrated to develop a proposed conceptual framework.

In this study, expert interviews were conducted to verify the proposed conceptual framework in order to confirm the relevance and importance of the proposed factors that may impact the performance of public B2B e-marketplaces. Having diverse background in mind, the experts were selected from both B2B e-marketplace practitioners and academics in order to ensure different ideas from different fields. Knowledge and viewpoints gained from different groups of experts can lead to a complete picture of public B2B e-marketplace evaluation. This study did not employ the Delphi method because of time-consuming process and lack of time commitment required from individual experts.

The selection of experts was based on their backgrounds and experience, using purposive sampling method. The interviews were sought from a panel of twelve experts with a division in three equal groups: four B2B e-marketplace market makers, four sellers participating in public B2B e-marketplaces, and four academics. The market makers are directors and managers of two leading B2B e-marketplaces in Thailand, namely Thaitrade.com and Pantavanij.com. The sellers are verified members of Thaitrade.com. Chief executive officers and owners of seller firms participated in the interviews. The academics are full-time lecturers from well-known universities in Thailand. Following expert selection, the interviews were carried out.

The expert interviews were based on in-depth interviews using a semi-structured approach with well-defined questions and topics that need to be covered during the conversation. This provides an opportunity to gain insights and elicit new information regarding public B2B e-marketplace

performance evaluation. Nine face-to-face and three telephone interviews with the experts were conducted. The telephone interviews were only used with sellers who live in the different geographical regions of Thailand. Each interview lasted about 60 to 90 minutes. The interviews started with a brief introduction to the objectives of the research and interview, followed by two main parts of the semi-structured interview. First, the open-ended questions were carried out to elicit insights into the research question. Experts were asked to indicate key factors and measures for evaluating public B2B e-marketplaces, without seeing any factor as well as evaluation framework for evaluating public B2B e-marketplaces including the proposed conceptual framework of this study. Second, 18 factors in the proposed conceptual framework as well as the operational definitions and related measures of individual factors were presented to the interviewed experts. They were asked to express their opinions on both relevance and importance of the proposed factors and related measures in the conceptual framework. Consequently, experts' responses on the relevance and importance of the individual factors were collected. Following the interviews, the analysis of individual interviews was performed. The analysis and results are presented in the next section.

5 RESULTS OF THE INTERVIEW ANALYSIS

The analysis of the expert interviews started with listing all factors mentioned by experts in the first main part of the interviews, using the open-ended questions. The outcomes revealed 10 factors that were found to be highly relevant in evaluating public B2B e-marketplaces that support small exporters. The sum of individual factors mentioned by the experts in the open-ended interviews were calculated. Factors, rankings and frequencies with which individual factors were mentioned by the experts are listed in Table 1. The results are sorted by frequency.

Ranking	Factor	Frequency
1	The number and volume of transactions	11
2	The number of participants	11
3	The quality of information	9
4	Trust	7
5	Reputation	6
6	Financial performance	5
7	Web site design and usability	5
8	Functionality and value-added service	4
9	Customer satisfaction	2
10	Customer loyalty	2

Table 1. Rankings and frequencies of factors based on experts' responses

The outcomes of the first part were then combined with outcomes of the second part of the interviews. Eight out of those ten factors were the same as the factors in the proposed conceptual framework. The eight factors were the number and volume of transactions, the number of participants, the quality of information, trust, reputation, financial performance, Web site usability, and functionality and value-added service. Two new factors identified by the experts were customer satisfaction and customer loyalty. The same factors that appeared in the outcomes of both first and second main parts of the interviews were merged. This resulted in 20 distinct factors derived from experts' responses (see Table 2). The frequency outcomes of individual factors from the previous calculation (i.e., frequencies of factors shown in Table 1) were recorded and used in the next step of analysis. Next, the sum of individual factors mentioned as relevance and importance for evaluating public B2B e-marketplaces by the experts in the second main part of the interviews were calculated. For each expert's response, each individual factor that mentioned as relevance and importance for evaluating public B2B e-marketplaces in the outcomes of both first and second main parts of the interviews was only count once. Factors,

rankings and frequencies with which individual factors were mentioned by the experts in both first and second main parts of the expert interviews are presented in Table 2. The results are sorted by frequency.

Ranking	Factor	Frequency
1	The number and volume of transactions	12
2	The number of participants	12
3	Relative advantage	12
4	Functionality and value-added service	12
5	Trust	12
6	The quality of information	12
7	Security and privacy	12
8	Reputation	11
9	Technology competency	11
10	Web site design and usability	11
11	Transaction cost	10
12	Financial performance	6
13	Partnerships	6
14	Online completeness	6
15	Mobile commerce capability	3
16	Market forces e-readiness	3
17	the Internet and ICT infrastructure	3
18	Governance	2
19	Customer satisfaction	2
20	Customer loyalty	2

Table 2. Ranking and frequencies of all factors from the expert interviews

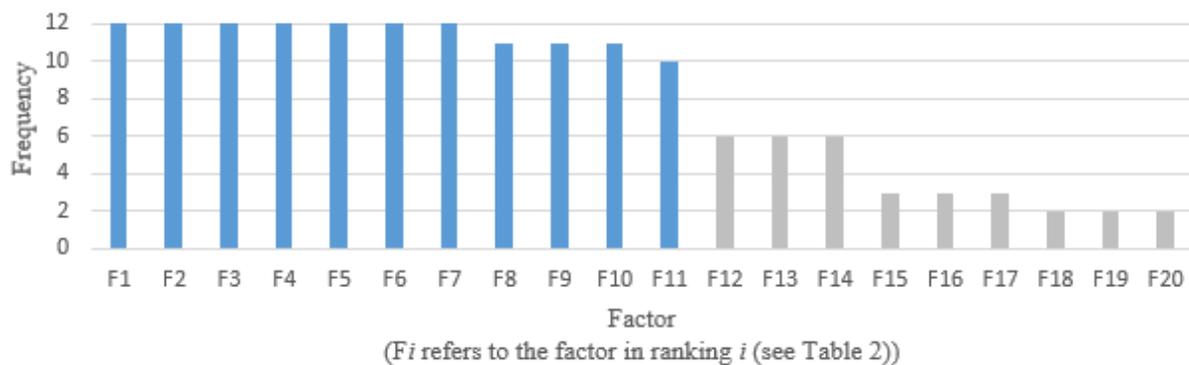


Figure 2. Frequencies of all factors based on expert opinions

Figure 2 shows a chart of results of the analysis of the expert interviews (based on the results shown in Table 2). The cut-off value of frequencies of factors is 10. Therefore, the top 11 high-ranking factors were used to develop an integrated conceptual framework of this study. Other nine lower ranking factors were dropped including the whole environmental view.

The proposed conceptual framework was revised based on the results of the expert interviews. Figure 3 shows the revised conceptual framework of this study. The results are as follows:

- The business view has two factors: the number of participants and relative advantage
- The transaction view has one factor: transaction cost
- The market service view has three factors: functionality and value-added service, trust, and reputation

- The infrastructure view has four factors: technology competency, the quality of information, Web site usability, and security and privacy.
- The performance view is determined by B2B e-marketplace usage (i.e., the number and volume of transactions).

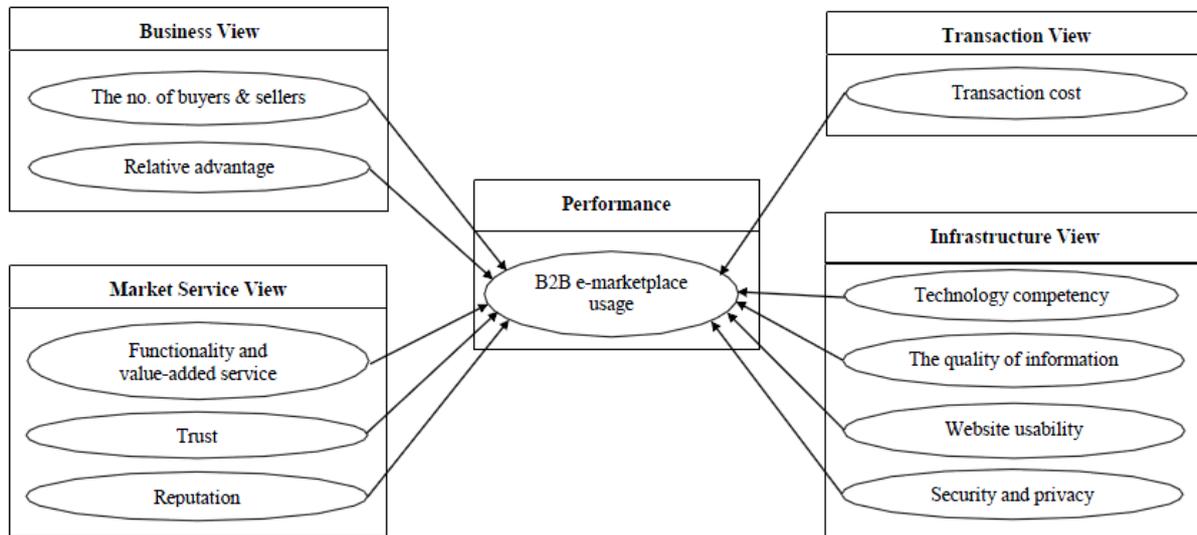


Figure 3. The revised conceptual framework for evaluating the performance of public B2B e-marketplaces

6 DISCUSSION

To study factors that impact the performance of public B2B e-marketplaces that support small exporters, this research initially proposed 18 candidate list of factors classifying into five views. The proposed conceptual framework was verified using expert interviews. Ten factors were emerged from the open-ended questions of the interviews (see Table 1). Eight out of those ten factors were the same as the factors in the proposed conceptual framework. The outcomes of the first part were combined with outcomes of the second part of the interviews. This resulted in the total of 20 factors examined in the expert interviews (see Table 2). The results of expert interviews confirmed only 11 factors for measuring the performance of public B2B e-marketplaces. Nine factors were dropped: governance and partnerships in the business view, online completeness in the transaction view, mobile commerce capability in the market service view, market forces e-readiness and the Internet and ICT Infrastructure in the environmental view, financial performance in the performance, customer satisfaction and customer loyalty. There are possible explanations for the results.

Firstly, a public B2B e-marketplace is at a relatively early stage of development in Thailand, the context of the study. ThaiTrade.com, the leading and official Thailand B2B e-marketplace, is owned and operated by Thai government. The government provides everything such as the infrastructure, training, and support services. This implies that participants are doing B2B e-commerce via a public B2B e-marketplace in the close environment. In other words, there is no competition. Therefore, the impacts of governance, partnerships, market forces e-readiness, and the Internet and ICT Infrastructure on the performance of public B2B e-marketplaces are not so strong in the context of the study.

Secondly, experts indicated that although financial performance is an important performance measurement, it is suitable only for public B2B e-marketplaces that their revenue models relied on transaction fees or other types of fees. However, ThaiTrade.com is a public B2B e-marketplace established with a community motive. It aims to improve adoption and implementation of e-commerce by SMEs. The e-marketplace does not collect any fee. Therefore, financial measures do not appear to have strong influence on the performance of public B2B e-marketplaces in the context of the study.

Finally, experts indicated that mobile applications and online completeness are useful for participants trading in public B2B e-marketplaces. However, trading between firms are typically involved relatively large volumes. Further negotiation between buyers and sellers are needed. The buying or selling of goods can be eventually conducted online or offline. Therefore, mobile applications, online completeness, customer satisfaction and customer loyalty have less impacts on the performance of public B2B e-marketplace than other factors.

7 CONCLUSION AND FUTURE WORK

This study identified key factors to evaluate the performance of public B2B e-marketplaces that support small exporters from key stakeholders, both the market maker and seller perspectives, by developing and proposing an integrated conceptual framework. The proposed conceptual framework was initially developed based on the literature review. It integrated factors from both B2B e-marketplace performance and Web site evaluation perspectives. Eighteen key factors identified in the previous studies were derived and categorized into five views, namely the business view, the transaction view, the market service view, the infrastructure view, and the environmental view. The performance of public B2B e-marketplaces is represented by B2B e-marketplace usage, which is determined by the number and volume of transactions. All factors and views were integrated to develop a proposed conceptual framework. The operational definitions and importance of the proposed factors were explained.

The expert interviews using a semi-structured approach were conducted in order to verify the proposed conceptual framework. Following the interviews, the analysis of individual interviews was carried out, and the results were illustrated. The open-ended questions of the interviews revealed 10 factors that contribute to the performance of public B2B e-marketplaces. These factors were merged with the factors in the proposed conceptual framework, resulting in 20 distinct factors. The results of expert interviews confirmed only 11 factors for measuring the performance of public B2B e-marketplaces. They were the number of participants, relative advantage, transaction cost, functionality and value-added service, trust, reputation, technology competency, the quality of information, Web site usability, security and privacy, and B2B e-marketplace usage. Nine factors were dropped. Finally, the proposed conceptual framework was revised based on the results of the expert interviews.

This research adds value to the literature by identifying major factors that contribute to the performance of public B2B e-marketplaces. Furthermore, B2B e-marketplace market makers or managers can use the framework as a guide to evaluate and improve their e-marketplaces to better meet users' needs. This study provides a basis for future research. The revised conceptual framework should be empirically validated using large-scale survey and hypothesis testing in order to examine how the proposed factors impact the performance of public B2B e-marketplaces.

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