



A Conceptualization of B2B Electronic Commerce Success From Sell Side Perspective

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Abstract

In our paper, a new approach for critical success factors of Business to Business (B2B) electronic commerce is presented. Important aspects of this approach can be classified into three main groups; environmental, internal and inter-organizational factors. The first group pertains to the factors that change the conditions equally for all companies in the business space and are out of influence of firms. Internal factors comprise individual features of companies, such as business strategies, culture, resources and etc. The Inter-organizational dimension is included the factors that are related to organization ability to set up Inter-organizational relationships electronically. Experimental results showed promising in evaluating the quality of business enterprises.

Keywords

B2B, electronic commerce, success, sell-side perspective

1. Introduction

The Internet is transforming and reshaping the nature of inter-organizational commerce by providing new types of electronic exchanges. The term electronic commerce involves sharing business information, maintaining business relationships and conducting business transactions by means of telecommunication networks [1]. It also refers to the procedures, policies and strategies required to support the incorporation of electronic interaction to the business environment. B2B is a kind of electronic commerce that defined as a new organizational form residing in digital space and established by two or more business. B2B enables firms to conduct and engage in online relations bypassing the intermediaries needed to effectively doing business transactions in the traditional off-line way. The growth of B2B electronic commerce has been (and will continue to be) a much more significant business activity of far higher value and will impact nearly all organizations in the long run. The most experienced and successful electronic commerce companies are beginning to realize that key determinants of success or failure are not merely web presence or low price, but there are many factors that impact on it. Some of them are environmental factors, which change the

conditions equally for all companies in business space, and firms have no influence on them; and the others are influenced by business strategy, organizational infrastructures, technical skills, and resources and so on.

2. Subject Description

The evaluation of success of B2B electronic commerce is complicated task that is related to many factors. This is because, success of electronic commerce can be viewed from several viewpoints, such as managers, competitors, business partners, stakeholders and government, and from each point of view effective factors are different. Several studies have been undertaken looking at success factors, issues, and requirements for B2B electronic commerce, but most of them have had no perfect viewpoint on success of electronic commerce and each of them focused on part of success. For example, some scholars pointed out the importance of content currency for website success [10] and the other researches investigated the evaluation to the financial aspects in the B2B electronic commerce [2]. The second shortage is in addressing the nature of factors. Some factors are resulting from individual features of companies and the others are environmental, which companies can not change. So there is no proper classification on the factors that are presented in these

models. The third problem is that the factors in the mentioned models are very general. For accurate evaluation, the factors should be explained in more detailed by using sub-factors. Finally, the last issue is that most models have investigated the factors that have impact on all kinds of electronic commerce strategies such as B2C, B2B, etc.

While the previously listed issues are important to success of electronic commerce, in this paper they are classified from seller viewpoint. From the sell-side perspective, organization attempts to sell its products or services to other organizations electronically, from their own private e-marketplace and/or from a third-party site.

3. Research Objective

This paper will address important aspects of electronic commerce success in the B2B sector. Its purpose is to gain a better understanding of the dimensions that affect the success of B2B electronic commerce. The primary research question this paper seeks to answer is: What are the important factors that affect success of a B2B electronic commerce from seller viewpoint?

4. Literature Review

In the electronic commerce area, there is a general lack of models and frameworks for evaluating the degree of success. But our process has uncovered multiple sources which try to design criteria for evaluating success. Here, briefly some of the literatures that are interesting as a foundation for our evaluation criteria model are presented.

Some scholars have studied the evaluation of economic benefits of e-commerce. Peiji et al [2] have investigated the evaluation of financial aspects in the B2B e-commerce model. Their proposed index system consists of index of B2B strategy evaluation, index of market evaluation, and index of application evaluation. This system can directly reflect different attributes, such as the evaluation target, content, and then compose ordinal masses in terms of subject connection and level principle. This model divides the index system of the B2B e-commerce model into three aspects by analyzing and researching some factors interrelated with the sale model of B2B. The factors are subdivided into 16 targets, which are not completely independent of one another.

Electronic Commerce 2004 [3], written by Turban et al pointed out that the following factors are critical for success when it comes to e-commerce:

- Specific products or services traded
- Top management support
- Project team reflecting various functional areas
- Technical infrastructure
- Customer acceptance
- User-friendly Web interface
- Integration with corporate legacy systems
- Security and control of the EC systems
- Competition and market situation
- Pilot project and corporate knowledge

- Promotion and internal communication
- Cost of the EC project
- Level of trust between buyers and sellers

As it can be seen, the factors contain everything from user interface to marketing and top management support.

Armand St-Pierre [4] offers a conceptual framework to evaluate whether an e-commerce application should be implemented. The framework is described to help the owners of the ecommerce applications to assess their relevancy and performance and is centered along three major domains: Management, Technology, and Human Interface. The owners of the e-commerce applications have to justify them based on a cost-benefit analysis in the long run (cost effectiveness). An organization faces continuous challenges, such as new media and technology and managers have to plan, coordinate, and manage these changes adequately. Proper training and professional development programs are necessary ingredients to assure the success of an e-commerce application during its operation. The technology domain includes quality factors that can be broadly categorized into three classes. The first class contains those criteria (reliability, efficiency, usability) that pertain to the use of e-commerce application after it has become operational. The second class pertains to the maintainability (testability, flexibility) of the e-commerce system that integrates all business applications. The third class includes factors (portability, reusability, interoperability) that reflect the ease with which a transition to a new environment can be made. A good example of the last class is when an e-commerce application is transformed from a UNIX to a Windows environment. Human interaction domain is for the assessment of key elements in users interface design with respect to the presentation of information (quality, quantity, accessibility), display of presentation (quality, text appearance, colors and graphics), and usability (ease of navigation, effective task completion, effectiveness of the business link). These determinants must be evaluated carefully to encourage users to do e-commerce.

Molla and Licker have proposed a partial extension and specification of the DeLone and McLean model of information system success to e-commerce success [5]. This article has emphasized the need for a dependent variable to e-commerce success, customer satisfaction, and its relationships with e-commerce system quality, content quality, use, trust and support. They have stated that success is a multidimensional construct and underlying the e-commerce systems are the business models that determine the nature of the product or service offering, the actors and role players and the revenue stream.

The United Nations Conference on Trade and Development (UNCTAD)'s "Electronic Commerce and Development Report 2002" [6] provides a great deal of information on e-commerce from a variety of countries. The purpose of the report is to influence the expansion of e-commerce in small to medium-sized companies in developing countries. Most of the emphasis of the report is on the issues relating to the regulatory interface,

intellectual property protection, and the telecommunications infrastructure. Unfortunately, the data provided does not address e-commerce infrastructure critical success factors. Jennex [7] found that the most important attributes were trust, technical infrastructure (including the telecommunications infrastructure), cost advantage, and protection of intellectual property. So, he mapped the UNCTAD report to the B2B Infrastructure Success Factor model attributes and generated a B2B e-commerce infrastructure success model for SMEs in developing economies. The e-commerce infrastructure success model has five factors: People Factors, Technical Infrastructure, Client Interface, Business Infrastructure, and Regulatory Interface. Each of these factors has many attributes among which 26 are found to be critical.

Chan and Swatman [8] studied the key factors involved in implementation of business-to-business electronic commerce in BHP (Broken Hill Proprietary Company Limited) Steel and present several factors influencing its implementation. These factors are:

- Commitment
- Trading Partner Participation
- Pro-active Approach
- Business Value
- Training and Educational Program
- Rapid Changes in Technology
- Complexity and Compatibility of Technology and Process

5. Critical Success Factors

In our study after reviewing some of the relevant researches all of the important factors that were critical in the previous models were collected during this phase. We found that although most of the issues are important, some of them are very critical. Therefore, to obtain a full understanding of the critical success factors, these aspects need to be focused on. In the following, we present critical success factors of B2B e-commerce based on seller viewpoint.

At the first of all, factors are divided into three main groups: environmental, internal and inter-organizational factors. The first group includes factors describing the environment in which the seller-buyer relationship operates. These factors change the conditions equally for all companies in the business space, and firms have no influence on them. The second group includes individual features of companies, which are different from one company to another. The Inter-organizational dimension is included the factors that are related to organization ability to set up Inter-organizational relationships electronically. Each of these three groups is detailed into sub-factors which are explained more here.

5.1. Environmental Factors

Four issues that are known as critical environmental factors are: government support, business environment, intervening infrastructures.

5.1.1. Government Support

The government affects the electronic commerce companies by laws, regulations, investments in the infrastructure and different restrictions. The government is responsible for how well a country is developing to create a good environment for e-commerce. It is the government's actions that will give the country's businesses competitive advantage for today and for tomorrow.

A company must always have good knowledge about what's new and changed in the government's policies to be able to perform in a suitable way for achieving the best commerce as possible. If there is an understanding between the business and the authorities, e-commerce will have a large opportunity to develop in that country. Important to understand are the laws and regulations that different countries have, when a company do B2B transaction on the internet it doesn't feel the boundaries but when it comes to the physical distribution, one will directly meet the problems. Therefore it is very important that the e-commerce company know the countries, so they can be prepared for complications in any part of the world.

5.1.2. Business Environment

Business environment is another important issue that a company should have knowledge about competitors' position in the market, market share and the variety of business partners needs. The company should be aware about the competitors' electronic commerce plans and effects of their plans on its planning.

Also company should be ready for decreasing customers because of competitor presence in electronic commerce, and should have good knowledge about needs of different partners; since only through fulfilling their needs a company can gain competitive advantage in industry and increase its market share.

The most important factor in this issue is readiness of business partners. To succeed in business-to-business electronic commerce, the corporate organizations must consider the readiness of their appropriate trading partners to get involved in business-to-business electronic commerce. The invited trading partners must be ready to participate in term of infrastructure and business. For business, trading partners getting involved should prepare their business to get the benefits from participating.

5.1.3. Telecommunication Infrastructure

Telecommunication Infrastructures in the environment facilitate doing electronic transactions. Some of the most important features of any telecommunication infrastructure are: speed, functionality, reliability, availability of terminal equipment and price. It is very essential that telecommunication infrastructure supports large file transfers at reasonable speeds and costs.

5.2. Internal Factors

The internal factors include the areas that are under control of companies and are different from one company to another. These factors are detailed into three sub factors: business infrastructure, human resources and technical infrastructure.

5.2.1. Business Infrastructure

Five issues that are known as important Business infrastructures are: structure, knowledge, strategy, flexibility and stakeholder satisfaction. To further understand these five elements, it is necessary to look at their inner relations.

Three of these factors have direct impact on the success of the company: knowledge, flexibility and stakeholder satisfaction. The other two; organization and strategy, are harder to understand. Since strategy is derived from the knowledge base of the company and needs flexibility for implementation.

Strategy is important for every electronic commerce company to fulfill their goals and vision of doing transactions online. Executives should have clear understanding about integration of electronic commerce strategy to corporate strategy. On the other hand, the strategy of a company should reflect its unique capabilities to gain advantage in electronic commerce arena. Good strategy directs the company towards stakeholder satisfaction. Strategy is built on knowledge. Good knowledge base increases the likelihood of a successful strategy. Organization on the other hand has different influences over future success. Through company culture, or structure, it can influence the knowledge and the flexibility of the company.

Flexibility is defines as company's ability or response to change or the dimensions resulted from that change. A flexible company is more likely to be able to implement an electronic commerce strategy successfully and accept innovations especially about ecommerce.

5.2.2. Human Resource

Human resource management and creating a learning organization is one of the core concepts for electronic commerce companies. These two ensures the fact that the more the organizations are aligned to learn quickly, the more they will gain the capability of adapting to the fast changing technology and electronic commerce environment. To measure quality of the human resources and the flexibility of the organization, Turban et al [3] suggest the following criteria:

- There must be web based training opportunities in the company,
- The number of hours spent per worker for educational and training purposes.

5.2.3. Technical Infrastructure

Technical infrastructure is one of the main drivers of the electronic commerce. Under technological development, following issues can be listed [21]:

- Existence of standards and documents of current information systems,
- Possibility of servicing to partners via electronic commerce system,
- Integration between departments via computer network,
- Integrated front end applications and back end applications,
- Developing an intranet through which collaborative product design across locations and among multiple value systems participates can be enabled,
- Following the technological trends and technology markets to innovate different channels and products to provide new values both to company to provide efficiency and to their business partners (Such as development of mobile applications, instant messaging products etc.)

5.3. Inter-organizational Factors

For companies wishing to begin a B2B e-commerce venture, there are some factors that ensuring a good communication between partners. So we investigate as an important aspect in three main issues: B2B application, support services and trust.

5.3.1. B2B Application

As it mentioned before, B2B is the use of web-based technologies to conduct business between two or more companies. B2B transactions can take place directly between companies or through a third party who helps match buyers and sellers. In summary, there are four general types of B2B applications:

- Buy-side applications
- Sell-side applications
- Trading partner agreements
- E-marketplaces

All kinds of B2B applications allow business customers and distributors to purchase goods and services through electronic technology that have varying degrees of implementation. When we consider the requirements of B2B, we must look to leverage all existing systems and bind them, within or between enterprises, to support any and all business processes. Fundamentally, B2B application integration is about leveraging existing systems and databases by allowing them to communicate seamlessly in support of a business purpose. It is, at its foundation, the mechanisms and approaches to allow partner organizations, such as suppliers and consumers, to share information in support of common business events [22]. In short, B2B application integration is the controlled sharing of data and business processes among any connected applications and data sources, intra- or inter-company. The challenge of B2B application integration is to be able to share data and processes without requiring sweeping changes to the applications or data structures. This integration takes into account the differences between integrating applications between enterprises, and

supports a single process model that spans both. This process can take on several dimensions, including:

- Data-oriented
- Application interface-oriented
- Method-oriented
- Portal-oriented
- Process integration-oriented

In brief, organizations must understand both business processes and data. They must then use this understanding to determine which processes and data elements require integration and then choose the best integration method.

Addition to B2B application integration, quality of these applications is a noticeable issue that can follow the same principles as software quality. According to the ISO 9126 standard [9], software quality consists of six quality factors, which are functionality, reliability, usability, efficiency, maintainability and portability. Since our approach is from seller company perspective, we emphasized on functionality, usability, reliability and efficiency; because maintainability and portability are important factors from developers point of views. Addition to these four quality factors, another important factor is B2B application integration.

Functionality refers to a set of functions and specified properties that satisfy stated or implied needs [9]. Some of these properties follow [10]. The name of the seller website and the time needed to interact with the site's web pages create the first impression to the buyers, given the fact that the buyer expects direct access to the seller web site and navigability through the web pages. Navigability, pleasant interface, compatibility with all kinds of browsers, multi-linguality and provision of accurate information also play an important role. Another important facility is the ability to find the right information at the right time; the availability of a search engine service and the creation of shopping categories can aid in reducing search time, but in order to search with efficiency, one needs an operable search engine and a functional site map. The other basic functional characteristic of e-commerce is the procedure of payment. There are various methods of payment [11], such as digital currency, electronic credit card and electronic check payment. In all the above methods of payment, a very important parameter is security.

Reliability [12] refers to a set of attributes that bear on the capability of software to maintain its performance level, under stated conditions, for a stated period of time. The reliability, as far as B2B applications are concerned, is related to the accuracy of the information provided about products, as well as the consistency of the services.

The application is reliable when it restores transactions, even in the case of a system failure. The basic characteristic of B2B applications related to reliability is security of electronic financial transactions. Five blocks of security have been identified [12], as far as Internet transactions are concerned. These are confidentiality, authentication, access control, data integrity and business partner's accountability. For this purpose, means like digital certificates and the SSL

(Secure Socket Layer) have been created and their role is to guarantee the security of transactions. The aforementioned means, using cryptographic methods, ensure the reliability of ecommerce systems, even in the case of system failure. Another important characteristic of B2B applications is privacy of personal information. Certain businesses may want to limit the number of detailed information that they are required to provide to a B2B application, in order to complete a transaction. Others may allow the disclosure of personal information, only if they have access to the collected information, or may want to maintain a personal record and analysis of what personal information has been collected [13]. A reliable B2B application should provide the possibility of such actions.

Usability is defined as a set of attributes that bear on the effort needed for the use and on the individual assessment of such use by a stated or implied set of users [9]. Usability can be detailed into understandability, learn-ability and operability. Based on the definition, it is obvious that the quality factor of usability is related to characteristics of any e-commerce system, such as provision of accurate informative texts about products and services offered, as well as provision of thumbnails, photographs and videos presenting the services and products available [10]. Additionally, a well- designed interface that facilitates navigation, contributes to the usability of ecommerce systems. Another important characteristic, related to usability, is easy and simple access to the web site of the virtual shop. A web site can either be accessed directly (by means of its name), or indirectly (through a web search engine). Finally, a usable B2B application should enable business partners to adapt the web pages to their own personal profile and needs. Consequently, applications that process profile and adjust the interaction based on one's specific needs and preferences are desirable characteristics of ecommerce systems.

The quality factor of efficiency [14] refers to a set of attributes that bear on the relationship between the software's performance and the amount of resources used under stated conditions and it contains time behavior and resource behavior. Based on the definition above it is argued that efficiency is also important to the quality of B2B applications.

Navigation through the web pages should be completed at the minimum time possible, and access to the categories of products and relevant descriptive information should be easy [10]. Therefore, an efficient B2B application should rely on partner's profile and preferences and other information available.

5.3.2. Information Quality

One of the biggest challenges facing companies today is how to provide up-to-date information to customers and suppliers when implementing a B2B eCommerce system. Typically, this information is maintained on enterprise systems and is available to in-house customer support representatives and purchasing managers, but not to trading partners using B2B eCommerce interfaces. The

largest return on investment from B2B eCommerce comes when information, such as order status, account status, customer-specific pricing, inventory availability, and purchase order status, is provided directly to trading partners. This information can be made available through many B2B mechanisms including a Web-enabled interface, electronic interchange of data through the use of e-procurement systems and e-marketplaces, or even through order files generated by trading partner purchasing systems and then sent to the host company's system.

The organizations must prepare themselves for being business-to-business electronic commerce companies. Maybe the organizations should change their information culture within the organizations to be ready for integrated one. Information regarding supply chain and selling chain must be integrated into a standardized format in order to share information among trading partners.

Information quality of any B2B electronic commerce system can be defined by these criteria: precision (Accurate and clear information about products and services), format (presentation of the information in a useful manner) and time (information is in time and genuine).

5.3.3. Support Service

Recent research shows that price and promotion are no longer the main draws for businesses to make a decision on a purchase [15]. More and more sophisticated businesses would rather pay a higher price to companies who provide high quality e-service [16, 17]. Market research has indicated that service quality has a significant impact on customer satisfaction, loyalty, retention and purchase decisions, and even on company's financial performance. Thus, to build trust and loyalty between partners, and keep buyers retention, a company must shift the focus to service quality before, during and after the transactions. Also, the provision of frequently asked questions (FAQ), or means of direct access to the ecommerce shop (telephone number, fax and e-mail) should be included in a self-service of electronic commerce system.

Kim and Lee [23] present a theoretical model that examines the relationships among perceived quality level and final performance of e-commerce systems. The found that overall service quality can be divided into five dimensions representing various service attributes: tangibility, reliability, responsiveness, assurance and empathy.

The tangibility dimension represents the physical facilities and appearance of e-commerce systems. For example, for B2B e-commerce, the tangibility dimension measures the appeal of the visual designs an e-commerce system presents to their trading partners. The reliability dimension represents the ability of the e-commerce systems to perform the promised service dependably and accurately. The responsiveness dimension denotes the willingness of e-commerce systems to help customers and to provide prompt service. The assurance dimension refers to the knowledge base of the B2B e-commerce

system that induces partners' trust and confidence. For example, the assurance dimension measures whether the Internet business system provides a high level of security mechanisms for individual partners. Finally, the empathy dimension stands for the caring and individualized attention that the e-commerce system gives its customer. For example, the empathy dimension measures the degree of sincerity conveyed by the e-commerce system in attending to the individual partner's benefit.

In summary, three of these dimensions have direct impact on the success of B2B: reliability, responsiveness and assurance. The other two; tangibility and empathy, are more important for customers in B2C electronic commerce.

5.3.4. Trust

The trust should be even more important in the e-commerce than in the traditional commerce because of the paucity of rules in regulating the e-commerce and because online services and products typically are not immediately verifiable [19]. B2B is about electronic trading between companies. The participation of trading partners is vital to the success of the implementation. A good relationship and trust between the two parties, who will work together, have been shown to be very important for the success. When making an assessment of the trustworthiness of an individual or organization Dutton argued that trust is impacted by several factors [20]. Within the context of B2B e-commerce at least two of these factors apply. These factors include: predictability and competence.

A sense of predictability must be based on the knowledge that business acts in consistently positive ways. Business partner in an e-commerce transaction may reasonably expect the e-commerce business to behave consistently. It is possible that the actions of business may change which would impact consistency. However, if the business partner understands the reason for and anticipates the change, predictability will not suffer. Predictability is a starting point for the development of trust in inter-organizational relationships. Therefore, the more predictable a business views another to be, the higher the trust in that party. It is expected that this holds in e-commerce relationships.

The difficulty in linking competence to trust is that the majority of people are unable to critically evaluate the competence of specialists. Dutton [20] argued that competence contributes to the building of credibility. The greater the credibility the greater the confidence and willingness to trust the other party and value the relationship. Also he identify that competence is an important dimension of trust in technology intensive business. Due to the technical nature of e-commerce, perceptions of technical competence are particularly important in B2B relationships. In B2B ecommerce, if the trusting party is not confident of the other party's competence to carry out a transaction successfully and securely, the trusting party will be less willing to trust and engage in that transaction.

6. Comparison and Evaluation

In this session, a quick survey of success factors that are commonly mentioned in the recent literature on B2B electronic commerce is presented. The analyzed literature is a condensed extract from books and papers concerning the electronic commerce, and addresses the issue of success. Eight sources are briefly described in Table 1. These sources are compared in ten issues that are addressed as critical success factors in our paper.

As it is observed, most of them had no comprehensive viewpoint regarding the success of electronic commerce, and each of them only focused on parts of the success. For example, some papers have pointed out the importance of environment and the others have investigated the individual features of companies. Our research tries to embrace all factors that have been mentioned in other models from sell side perspective in a B2B electronic commerce.

Table.1 comparing electronic commerce success and issues studies

Papers	External Factors			Internal Factors			Inter-organizational Factors			
	Government Support	Business environment	Telecommunication Infrastructure	Business Infrastructure	Human Resources	Technical Infrastructure	Trust	Support Service	Information Quality	B2B Application
Armand [4]	--	✓	--	✓	--	--	--	--	--	✓
Molla [5]	--	--	--	--	--	--	✓	✓	✓	✓
Stefani [10]	--	--	--	--	--	--	--	--	✓	✓
Jennex [7]	✓	✓	✓	--	--	✓	✓	--	--	--
UNCTAD [6]	✓	--	✓	✓	✓	✓	--	--	--	--
Peji [2]	✓	✓	--	✓	✓	--	--	✓	--	--
Turban [3]	--	✓	--	✓	✓	✓	✓	--	--	✓
Chan [8]	--	✓	✓	✓	✓	--	--	--	--	--
Our Paper	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

7. Conclusion and Future work

Electronic commerce is still a rather young area and lack of models and frameworks make the task of evaluating electronic commerce success risk. In this paper, using the literature in this field, a new approach for gain success of a B2B electronic commerce was provided. Several studies have been undertaken looking at success factors, issues, and requirements for electronic commerce. We studied briefly some of the most well-known success models to present the critical success factors of B2B electronic commerce. In this paper, the success of the B2B electronic commerce depends on factors that affect the capability of creating profit for seller companies, and also satisfaction of their business partners.

Further research into developing, validating and empirically testing these factors is proposed. Future work is weighting of these factors. Internal factors can be weighted through applying the model in different success seller companies in the same environment and calculating total degree of success in those companies. Also, the success factors of electronic commerce in different companies were not studied scientifically, as there is a lack of scientific literature for this area. For weighting environmental and inter organizational factors, success of B2B should be measured in a period of time that conditions are changed for business partners, and then the importance of each factor is calculated. Moreover, weights of factors are not equal in different countries; so this model can be customized for a particular country.

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