B2B E-Commerce Critical Success Factors - A Review

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The purposes of this paper is to identify critical success factors (CSFs, hereafter) for Business to Business (B2B, hereafter) Electronic Commerce (E-commerce, hereafter), the significant growth of B2B E-commerce applications is notable. More and more organizations are switching to online business to achieve better positions in the digital-based competitive market. The process of E-commerce is complex in nature and involves changes to business models and procedures. It is therefore worthy to study this new business phenomenon based on the experience of the organizations that have embarked on B2B E-commerce. The study identified 32 critical success factors applicable to most of the B2B E-commerce.
Keywords : B2B, Electronic Commerce, Critical Success Factors.

Introduction

The increasing globalization and use of the Internet technologies, accompanied with multiple resources, pose challenges to the modern management theories and success of entities in the market, accompanied with the number of emerging technologies which compete for integration within the current markets (Arns et al. 2002). These are coupled by the increasing competition within the markets on several criteria such as the five major operational performance objectives and several others. Not only this, the introduction of technology into firms has posed a big challenge as managers to sustain and strive a flatter hierarchy, in addition to maintaining a low cost budget and retention of the current employees simultaneously (Kotler and Armstrong, 2006).

Electronic commerce refers to the conducting of business transactions over electronic/computer networks, including the internet, (Barnes and Hunt, 2001) and therefore encompasses processes related to the buying, selling and trading of products, services and information, (Gunasekaran et al. 2002).

There has been considerable promotion given to the use of E-commerce in B2C markets, where transactions involving such activities as personal banking, ordering goods, and share trading are becoming increasingly common. However, the use of E-commerce for B2B transactions has been widely identified as an area with significant potential for future revenue generation and cost savings (Barnes and Hunt, 2001). For businesses, B2B can mean electronic interaction with the members of supply base, i.e. for inbound procurement, and with customers for transactions pertaining to their procurement activity.

Critical Success Factors for B2B E-commerce

The term critical success factor first came out in the literature in the 1980s when there was interest in why some organizations appeared to be more successful than others, and research was carried out to investigate the success components (Ingram, Biermann, Cannon, Neil, & Waddle, 2000). Critical success factors are "those things that must be done if a firm is to be successful" (Freund, 1988). Critical success factors should be few in number, measurable and controllable.

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There is little doubt that interest (both academic and in the world of practice) in supply chain management initiatives generally, and in E-commerce more specifically, continues to grow (Angeles and Nath, 2007). As E-commerce diffuses in practice, the need for supporting research in this area is indisputable, as is the requirement for deployment guidance for practitioners (Angeles and Nath, 2007).

Easton and Araujo (2003) make a compelling argument for adopting a contingent approach to the use of E-commerce in practice, arguing that particular circumstances relating to market and product characteristics must be taken into account when making decisions about the adoption and use of E-commerce. This argues for individual sector studies whereby these characteristics will not confound the development of knowledge nor create confusion for those implementing and using E-commerce in practice (Cullen and Taylor, 2009). Although studies have investigated E-commerce within the industries, these are still relatively few in number and have tended to deal with the design stage of systems (Joyce et al. 2006), sales and/or marketing (Lerer, 2002; Mukherjee and Nath, 2007; Rupert, 2002), and consumer online purchasing (Spain et al. 2001).

It is important to be clear on what we mean by success as it relates to E-commerce research, for without such clarity it is not feasible to identify factors that impact on it or to influence its achievement in practice (Cullen and Taylor, 2009). However, the preponderance of studies that focus on the start-up phases of system implementation as opposed to its on-going use is an issue that spills over into the problem of defining success. Where E-commerce implementation is seen as a project then relatively standard success metrics may be applied, such as on-time, within-budget completion; the meeting of system requirements; and system quality (Espinosa et al. 2006). Nevertheless, even in this case, it is not straightforward: Loh and Koh (2004), for example, fail to define successful implementation, instead seeming implicitly to regard success as lack of failure.

Research Methodology

The main purpose of this study is to identify critical success factors (CSFs) for B2B E-Commerce companies. Following an extensive literature review this research was able to find out 32 B2B E-Commerce critical success factors. The research approach for this study consists of a meta-analysis of the research literature. Research papers for analysis were gathered from leading information system journals for the 13 year period 1997-2009.

Studies on B2B E-commerce Critical Success Factors

Yan and Paradi (1999) identified the five critical success factors for financial institutions to compete in E-commerce market. They involve E-commerce strategy, innovation, risk tolerance, communication network and size of company assets.

Liu and Arnett (2000) obtained four major factors that are critical to Web site success in E-commerce from a research model derived from applying both information systems and marketing literature. The variables were defined to measure each factor. After the factor analysis, the critical factors include information and service quality, system use, playfulness and system design quality.

Viehland (2000) identified six factors critical to the success of the e-business strategy as to create a consumer-centric strategy, to accept outsourcing to improve business performance, to act like a new entrant, to utilize information management to differentiate company's product, to be part of an e-business community, and to require executive leadership.

Falk and Hogstrom (2001) explored Key success factors for a functioning supply chain in E-commerce B2B E-commerce is logistics, Payment must be easy and safe, delivery must be on time and performed securely, E-commerce will be as much as the logistics capability will perform, tie the whole supply chain together with help of information exchange and open communication, lower operative costs so that the E-commerce market will have a chance to compete with the traditional market, concentrate on the core business and avoid carrying out several services at the same time, face-to-face contact to a larger extent, make the customer more loyal to the E-commerce company, strong customer relationship, all involved parties must possess high competence through the whole supply chain, increased responsibility for the logistic provider, all involved in the supply chain are equally responsible for the e-commerce B2B success.

Thompson et al. (2001) explored that there is no clear idea on how firms are managing the B2B initiatives and what problems they face in deploying B2B E-commerce systems. The study examined the facilitators and inhibitors for deploying B2B applications. The preliminary analysis of data reveals nine categories of factors top management factors, organizational change factors, strategy-related factors, project management factors, valuation factors, collaboration factors, internal environmental factors, external environmental factors, external business environmental factors as affecting the deployment of B2B E-commerce applications in organizations.

For E-commerce success, Turban et al. (2002) listed CSFs which are user-friendly Web interface, delivery of specific and high-value services or products, support of top management, technical infrastructure, level of trust between buyers and sellers, security and control of E-commerce system, customer acceptance, mass customization, competition and market situation, optimization of scope of business, and creating new partnerships and alliance.

Mashari (2002) explored and analyzed eight cases of E-commerce application to several types of business. The analysis has covered the adoption methodology and approach, the driving forces for E-commerce application, the overall outcomes and the critical factors of success. The variety of the issues associated with the E-commerce concept requires that several considerations have to be taken into account. These might be of a technical nature, such as organizational or security, such as the scale of change to be made to current business models. Other considerations include cultural issues that relate to the employees level of acceptance of the new E-commerce technologies as well as customers' ability to use these technologies.

Jeffcoate et al. (2002) explored that how small businesses involved in E-commerce may benchmark their performance against a number of critical success factors (CSFs). The beginning step in this process is to identify the company's attitude to growth. Next, the Small Medium Enterprise should establish a suitable generic strategy and decide on a set of objectives that support it. Finally, it should identify a set of relevant CSFs. The approach is derived from a study done for KITE, an ESPRIT project that was designed to increase awareness of E-commerce amongst small and medium enterprises (SME). Analysis of the KITE interviews identified 11 CSFs content, convenience, control, interaction, community, price sensitivity, brand image, commitment, partnership, process improvement, integration relevant to the competitive performance of SMEs entering the E-commerce market.

Duffy and Dale (2002) explored that the greatest growth in E-commerce will be in the area of B2B, with a

proliferation of trade change activity in almost every sector. The overall challenges facing B2B are business processes, 24/7 operation and e-integration. While there will be always an element of consumerism in B2B, the majority will be pre-ordained business partnerships, where the purchaser is tied to contracts with suppliers. It is also envisaged that information technology systems will conduct the bulk of transactions, hence the lack of soft process issues in the analysis of B2B critical processes.

Wilson, S. and I. Abel (2002) examined the issues that must be considered before a firm embarks to develop a successful web business. This study concludes with a discussion of cost of building a website and some problems associated with conducting business over the web. The problems include the issues of security and privacy, and information overload.

Lu and Antony (2003) explored that advances made in the information technology over the last five years have been tremendous and many Web-based organization-to-organization information and transactional systems have emerged as a result, in which the B2B marketplace stands prominent and attracts a great deal of attention across industrial sectors. Firms can no longer afford to stand still and ignore these technologies in their supply chain development.

Madeja and Schoder (2003) investigated the web characteristics as significant success factors for web sites. Their investigation found that interactivity and immediacy are success factors for B2B web sites. Further, for B2C web sites, there are four success factors including media richness and -variety, availability and ease of use.

Jun and Cai (2003) empirically investigated key EDI obstacles experienced by US small manufacturing firms and, then, examined the relationships between the identified obstacles and their realized EDI benefits. This research revealed the following important findings. First, four dimensions of obstacles were derived: lack of managerial leadership/organizational readiness, lack of integration of EDI with internal/external computer systems, potential technical concerns, and security/legal concerns. Second, the lack of integration of EDI with internal/external computer systems turned out to be the most significant barrier to achieving the overall EDI success and three key EDI benefits, such as reduced administrative/transaction costs, improved information accuracy, and enhanced competitiveness in the marketplace. Third, the "lack of managerial leadership/ organizational readiness" and "technical concerns" dimensions were found to be the second and third most significant obstacles to the reduction of administrative/ transaction costs, respectively. Finally, the security/legal concerns dimension is considered a significant barrier to the overall EDI success.

Aggestam and Söderström (2004) explored that when information systems (IS, hereafter) are developed and implemented, in any context, a number of success factors determine whether or not the effort will succeed. Attention to success factors helps to avert some costly mistakes, and speeds up the way change is managed. The study focused on how to manage CSFs in organizations involved in standards- B2B, with a focus on organizational CSFs. An existing CSF framework in information system planning is applied theoretically to a B2B setting. Activities in a B2B standards implementation model are matched and compared against the framework. Results indicated that the framework is suitable for planning B2B implementations, essentially for strategic planning. In particular, the framework is also useful in the three phases: strategic planning, process analysis, and partner alignment. The framework does not deal with technological or economic issues, but focus on organizational ones. Despite this focus, results indicated

that the framework can be utilized implicitly for managing economic and technological issues as well. According to critical success factors for E-commerce companies which identified by Sung (2006) there are customer relationship, privacy of information, low cost operation, ease of use, E-commerce strategy, technical E-commerce expertise, stability of systems, security of systems, plenty of information, variety of goods/ services, speed of systems, payment process, services, delivery of goods/services, low price of goods/services, and evaluation of E-commerce operations. Based on the theoretical model of consumer acceptance of virtual stores proposed by Chen et al. (2004) the critical success factors are product offerings, usability of storefront, perceived service quality, and perceived trust.

Jennex et al. (2004) discussed the key infrastructure factors for setting up B2B E-commerce enterprise in developing countries. They are people factors, technical infrastructure factors, client interface factors, business infrastructure factors, and regulatory environment factors. Each factor comprise of several attributes. Knowledge of workers, worker technical skills, trust in the relationship between client and provider, knowledgeable client contacts, client contacts that can speak with the provider's language, and client contact methods are considered critical. Moreover, client interface factors are considered the most critical among these five factors.

Kaefer and Bendoly (2004) investigated the impact of two organizational constraints, technological compatibility and operational capacity, on the success of business-to-business (B2B) E-commerce (E-commerce) efforts over a range of business settings. Analysis was carried out on 86 firms in the consumer electronics industry, approximately half of which were service-providing firms and the other half product-manufacturing firms. Their findings explored that the inter-organizational context had a significant bearing on which constraints have a greater impact on the success of B2B E-commerce efforts.

Dubelaar et al. (2005) stated that the CSFs presented by the companies succeed in B2C e-business adoption is the combination of strong customer attention, clearly defined performance measures, a clear link between value proposition and measures, and incremental development process.

Li and Li (2005) explored the critical success factors for operating e-marketplaces from different perspectives. It is shown that the core of e-marketplaces is to capture value and build liquidity. Based on these findings, comprehensive critical factors including functional factors, strategic factors and technical Factors are discussed for the success of electronic marketplaces.

Kamal (2006) identified 42 critical success factors (CSF) for IT innovation adoption. These factors provide sufficient understanding of their importance when adopting an innovation (technology). These factors are PerceivedTechnology, Organisational Factors, External Factors, and Collaboration Factors.

Amoroso and Vannoy (2006) explore that a successful B2B development plan must incorporate the following: a consideration of outsourcing, the organizational culture and the level of readiness of the company to move to e-business. These factors affect the degree to which companies will recognize value from the B2B effort. As companies evaluate e-business for their own organizations, outsourcing to an ASP can help the company concentrate on core competencies, while using e-business to perform operational and strategic functions more efficiently. Additionally, the culture of the organization will impact the acceptance of B2B by the organization. Also, the level of readiness to move

will largely affect the success of the e-business endeavor.

Angeles and Nath (2007) explored three e-procurement success factors supplier and contract management; end-user behavior and e-procurement business processes; and information and e-procurement infrastructure. Three factors also emerged challenge-to-implementation, lack of system integration and standardization issues, immaturity of e-procurement-based market services and end-user resistance; and maverick buying and difficulty in integrating E-commerce with other systems.

Harland et al. (2007) extols the potential benefits of supply chain integration and the crucial role of integrated eBusiness to deliver those benefits. However, adoption of eBusiness in supply chains has been slower than expected, particularly in small to medium sized enterprises (SMEs). This study reports findings of a longitudinal study of four supply chains in different sectors over a 4-year period. Specifically it examines the barriers to adoption of E-business technologies and therefore to achievement of integrated information in supply chains. Differences between firms in supply chains and between supply chains were examined. The study reveals disparity between existing and planned use of eBusiness by larger downstream firms compared to upstream SMEs. The SMEs are cautious, only planning to invest in eBusiness if dominant downstream customers force them; however, they do not appreciate the full benefits to be gained from eBusiness adoption. The downstream larger businesses are forging ahead with eBusiness in 'eIsolation' and are not providing supply chain leadership. They are creating eLands with SMEs adrift of them.

Chong (2008) explored 19 influencing factors of E-commerce success, five factors: observability; communication channel; customer pressure; supplier pressure; and perceived governmental support, make significant contribution to the adoption of internet-based E-commerce in Australia; and only three factors: firm size; perceived readiness; and observability, have significant impact in Singapore.

Cullen and Taylor (2009) explored five composite factors that are perceived by users to influence successful E-commerce use. "System quality", "information quality", "world wide web - assurance and empathy", "management and use", and "trust" are proposed as potential critical success factors. Results indicated all respondents ranked system quality, information quality, and trust as being of most importance, but differences in the rankings between purchasing and selling respondents are evident.

Table 1 Summary of Critical Success Factors from Literature Review

Critical Success Factors	Literatures
Supplier or customer acceptance of electronic procedures	Al-Mashari (2002), DeLone and McLean 2003, Evans and Wurster (1999), Murphy and Daley (1999), Phan and Stata (2002) and Turban et al.(2000), Chong (2008)
Customer Acceptance	Chan and Swatman (2001), Duggan and Devenery (2000), Merrilees and Fry (2003), Poon and Jevons (1997), Quelch and Klen (1996), Ratnasingham (1998)
Easy and affordable access to the internet	Wilson and Abel (2002), Zairi, (1998) Chan and

	Swatman (2001), Duggan and Devenery (2000), Merrilees and Fry (2003), Poon and Jevons (1997), Quelch and Klen (1996), Ratnasingham (1998)
Confidence in accuracy of information given about delivery details	Al-Mashari (2002) and Jones and Beatty (2001) and Vijayasarathy and Tyler (1997)
Ease of use of the system	Al-Mashari (2002), DeLone and McLean (2003), Jones and Beatty (2001) and Turban et al. (2000), Madeja and Schoder (2003), Sung (2006)
Security of the system and information	DeLone and McLean (2003), Fairchild et al. (2004), Falk and Hogstrom (2001) Harland et al. (2007), Jun and Cai (2003), Phan and Stata (2002), Soliman and Janz (2004) and Turban et al. (2000), Cullen and Taylor (2009)
More efficient than alternatives	Baker et al. (2001), DeLone and McLean (2003), Hawkins and Prencipe (2000), and Kaefer and Bendoly (2004)
Quality information flow - accuracy of delivery times, stock levels, out of stock items	DeLone and McLean (2003), Fairchild et al. (2004), Gunasekaran et al. (2004) and Jones and Beatty (2001)
Seamless integration, i.e. not having to print and re-input	Jones and Beatty (2001), Mclvor et al. (2000), Murphy and Daley (1999) and Turban et al.(2000), Cullen and Taylor (2009)
Timely and efficient information flow - reliability in real time	Kaefer and Bendoly (2004), and Kehoe and Boughton (2001)
Technical Infrastructure	Chan and Swatman (2001),Duggan and Devenery (2000), Gogan (1996), Huff et al. (1998), Samiee (1998), Turban et al. (2002), Jennex et al. (2004)
Sustainable without having to replace and upgrade regularly	Soliman and Janz (2004)
Standardised system	DeLone and McLean (2003), Sung (2006), Messerschmitt (2000), Cullen and Taylor (2009), Angeles and Nath (2007)

Cheaper interaction and transaction processing than alternatives	DeLone and McLean (2003), Jones and Beatty (2001), Kaefer and Bendoly (2004), Motwani et al. (2000), Pisanias and Willcocks (1999) and Vijayasarathy and Tyler (1997)
When using a web site, number of hits	DeLone and McLean (2003) and Siegel (1999)
Access to a large number of suppliers or customers	Evans and Wurster (1999)
Existence of a trustworthy intermediary	Emiliani (2000) and Ranchhod and Gurau (1999)
Existing relationship with supplier or customer	Al-Mashari (2002), McNealy (2001), Min and Galle (1999) and Phan and Stata (2002)
Solid agreement between organisations (e.g. written contract)	Al-Mashari (2002) and Evans and Wurster (1999)
When using a web site, display of information to convey trust and knowledge	Evans and Wurster (1999), Phan and Stata (2002)
Confidence and faith (trust) between transacting organisations	Fairchild et al. (2004), Harland et al. (2007), Reichheld and Schefter (2000), Soliman and Janz (2004) and Turban et al. (2000)
Knowledge of perceived benefits	DeLone and McLean (2003) and Murphy and Daley (1999)
When using a web site, display of important legislation	Rothstein (2001)
Large purchasing or sales volume	Beamon (1999) and DeLone and McLean (2003)
Relevant to company strategy	Al-Mashari (2002) and Cagliano et al (2003)
The ability to purchase or sell products at a cheaper price	Baker et al.(2001), Emiliani (2000), Emiliani and Stec (2002), McNealy (2001), Porter (2001), Reichheld and Schefter (2000)
Ability to convey (on-line) a deep understanding of your business	Evans and Wurster (1999), Phan and Stata (2002)
Buying or selling products of known brands	Davis et al (1999), Kung et al (2002) and Rowlatt (2001)
When using a web site, display of association - recognisable bodies	Kanter (2001)

When using a web site, number of page views	DeLone and McLean (2003) and Siegel (1999)
When using a web site, number of registered users	DeLone and McLean (2003)
Management support	Al-Mashari (2002), Jun and Cai (2003), Motwani et al. (2000), Soliman and Janz (2004) and Turban et al. (2000)

Conclusion

It is expected that through market consolidation and globalization, organizations will find themselves within a strong competitive environment. Savings of costs will become the important target. In order to achieve and stay competitive, organizations will try to use various internet business models. Through a mix of interactivity, networking, and data processing, the Internet has made B2B e-commerce more accessible at a lower cost than older communication methods. B2B e-commerce helps organizations avoid value migration (that is, capture of growth in revenue, profits, and market value by competing firms) attributable to declining market prices (disinflation), rising competitive intensity, advanced technology (enabling increased communication flows), and reverse marketing strategies (customer-focused rather than product-focused) (Sharma, 2002). The potential of B2B e-commerce is not captured by merely mailing operations of transactions and automating document printing, but by encompassing all trading steps and collaboration between business partners. Firms need to recognize the importance of cross-firm process integration and make determined efforts to integrate B2B e-commerce in critical business processes.

This research is also useful for proponents of B2B e-commerce, especially software vendors. Software vendors are provided with an insight into the key factors that are significantly associated with B2B e-commerce adoption. Armed with this information, vendors can thus devise more effective and efficient promotion strategies for their B2B e-commerce software. This review of B2B E-Commerce critical success factors research has been restricted to leading information systems journals. This means that it may not be representative of all information systems journals.

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