

E-BUSINESS STRATEGY IN SUPPLY CHAIN COLLABORATION: AN EMPIRICAL STUDY OF B2B E-COMMERCE PROJECT IN TAIWAN

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ABSTRACT

With global economic development and growing international competition, supply chain collaboration (SCC) has become both an important strategic and operational issue. The organization therefore must rethink both its electronic business (e-business) and global supply chain management (SCM) strategies. This research investigates electronic supply chain (e-supply chain) integration through business-to-business (B2B) electronic commerce (e-commerce) application in Taiwan's information technology (IT) industry. The purpose of the study is to explore the critical success factors (CSFs) of e-business strategy impacting on SCC. The qualitative case study approach was adopted to investigate and analyze six international companies in Taiwan. The cases were all participator of the government supported 'industrial automation and electronic business program' (IAEBP) and had implemented B2B e-commerce projects for SCC. A computer-assisted qualitative data analysis software – NVivo is adopted that enables data coding and analysis to be performed. The developed research conceptual framework for this study will be used in the analysis of the findings. The findings present CSFs from the cross-case analysis that are categorized and discussed in term of key collaboration issues to impact the successful implementation of B2B e-commerce project by the firms. This provides academic and practical insights into e-business strategy for SCC.

Keywords: Supply Chain Collaboration, Supply Chain Management, Electronic Commerce, Electronic Business Strategy, Critical Success Factors

1. INTRODUCTION

The Taiwan's IT industry is currently undergoing radical changes. Technological change, firm strategies, national development and government policies are all playing a part in this process of change. In view of the importance of B2B e-commerce to Taiwan's IT industrial competitiveness, the government of Taiwan has drawn up the 'industrial automation and electronic business program' (IAEBP). The IAEBP as a benchmark system promotes the automation of production, warehousing, shipping and marketing management together with the adoption of e-commerce technologies in the SCM. To ensure that effective e-supply chain integration can provide

e-business success, the purpose of the study is to identify the CSFs in SCC. In recognizing the value of e-business strategy to SCC, both management and academics are interested in the areas of adoption and application. However the design and implementation of information system (IS) for effective SCM has not received adequate attention from both researchers and practitioners, in particular, the application of B2B e-commerce to SCC [17].

The developed research conceptual framework for this study will be used in the analysis of the findings from the empirical case study investigation, which draws on various theoretical perspectives derived primarily from the synthesis of the integrated literature.

Drawing on the research findings and analysis, the research study aims to contribute to the field of SCM by extending the knowledge on e-commerce

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technologies as they impact on the collaboration of supply chain components, the integration of supply chain processes with other business processes and the impact of the performance of the supply chain process on the overall business performance.

2. E-BUSINESS STRATEGY AND SUPPLY CHAIN COLLABORATION

More recently, 'e-business' has become a core theme at the heart of business strategy. A company should have a vision of where it wants to go with e-business strategy and move towards the trends of e-commerce application [18]. It is logical that e-business strategy should support corporate strategy objectives and also support SCM strategies. An established aspect of business strategy development is the focus of e-business strategy on business alignment. Bocij et al. [4] depict an alignment model focusing on alignment of the IS's plans and priorities with organizational strategy and business goals. Linking IS to objectives and CSFs, is one method of using the alignment approach. During the initial development of an e-business strategy, a business-alignment approach can be applied to ensure that IS strategy supports e-business strategy. Schnieerjands and Cao [30] demonstrated the important variables of the business environment, operations management strategy and IS strategy being aligned or fitted in order to achieve successful e-commerce business performance. They identified CSFs for both operations management strategy development and e-business strategy development that must be considered useful for e-commerce success.

Collaboration in the supply chain has been widely discussed [2, 31]. The literature review on the subject has been carried out from a number of perspectives that include: technological change, inter-organizational linkages, partnerships, B2B integration, evolutionary, economic frameworks, sociological approaches, networks as the interface between marketing and innovation, geographical explanations and the influence of policy and strategy. Anthony [2] argues that SCC occurs: "when two or more companies share the responsibility of exchanging common planning, management, executive and performance measurement information" (pp.41-42). La Londe [22] proposed that SCC comprises the following six elements: (1) mutual trust between each business partner; (2) sharing of information; (3) sharing of knowledge; (4) relatively long planning horizon; (5) multiple-level relationships; and (6) process for sharing benefits and burdens. Huxham [20] described collaborative advantage as being concerned with the creation of

synergy between collaborating organizations. In practice, a successful SCC increasingly depends on technology for inter-firm cooperation. Such examples include information sharing, value-added partnerships and electronic integration.

As mentioned above, it is evident that e-commerce might provide the organization with an improved method for realizing e-business strategies and strengthening their competitive advantages for SCC. Therefore, SCC has become a significant strategic and operational issue to the firm.

3. CRITICAL SUCCESS FACTORS FOR E-COMMERCE PROJECT

The CSFs approach has been applied successfully in many areas of IT research, including identifying corporate information and system needs, data management and project management. Moreover it has been identified in the literature that the CSFs for SCC have close relationship with the industry context. However, no strong consensus exists in the e-commerce project management literature on how to define project success, although a number of models and techniques have been developed to facilitate the definition and measurement processes of project success. There also exists a link between choosing appropriate CSFs to engage the management's interest and their support for the project-based activities.

Slevin and Pinto [32] developed supporting criteria for factors of project success identified in a previous survey. These factors such as a clear mission, top management's continued support, a well-defined project schedule or plan, stakeholders' (clients, end-users etc.) involvement during the project development and implementation phases, competent personnel, the application of appropriate technology and stakeholders' acceptance of the project deliverables are defined as CSFs. In addition to these CSFs, other processes such as continuous bilateral communication among the team members and between the stakeholders and the project leader through formally established communication channels and continuous monitoring and feedback of the project phases are also required in conjunction with the CSFs to achieve the project objectives.

Ngai et al. [25] conducted a research study using exploratory factor analysis on the collected data with the aim of investigating the underlying structure of the identified CSFs for the IS implementation of SCM and its collaborative integration. They classified the CSFs into five dimensions: communication, top-management commitment, data security, training and education, and the reliability of hardware and software. Angeles et al. [1] highlighted the CSFs for

implementing a B2B e-commerce system for SCC whereas in order to influence the agility of SCM. Within the same regard, Gunasekaran and Ngai [17] identify the similar CSFs for the application of e-commerce technologies in SCM, the integration of partners and the successful implementation of B2B e-commerce in a supply chain. However, the success of the implementation of an e-commerce project is associated with those factors that influence the goals and objectives of each project as they relate to a specific or overall business strategy, partnerships, organizational resources and performance. An intriguing fact that emerges here is that the different IS development projects are likely to have similar basic goals across organizations or industries. Therefore, CSFs can be usefully assessed for the strategic implementation of e-commerce.

As cited above, CFSs can be defined at different levels, embracing different aspects of a project. Therefore, this research study is typically interested in defining the basic CSFs for the successful implementation of an e-commerce-based project. It has also been assessed that regardless of the nature of SCC that are equally valuable across organizations and industries. Reviewing the literature, it has been learnt that the internal and external CSFs for implementing a highly integrated B2B e-commerce system are considered relevant in SCC.

4. THE RESEARCH CONCEPTUAL FRAMEWORK

The developed research conceptual framework for this study is shown in Figure 1, which draws on various theoretical perspectives derived primarily from the synthesis of the integrated literature. Ives et al. [21] provides a tool for identifying the business entities such as customers, suppliers and projects that will benefit most from an integrated global IT management system. Turban et al. [36] use the CSF approach to identify the global drivers and how e-commerce implementation is determined by the global e-business strategy. Pant et al. [26] suggested that the internal and external CSFs of implementing a highly integrated B2B e-commerce system are considered relevant to SCC.

This model assumes that the integration between supply chain partners has positive performance outcomes for the e-business strategy. In addition, it indicates that the impact of B2B collaborative e-commerce on a firm's performance is mediated through supply chain integration and a collaborative relationship between trading partners. With regard to this integrated model, both the external competitive market environment and the internal organizational factors impacting on the success of SCC are considered. The key themes of the

literature are the relationship between the e-business strategy, B2B collaborative e-commerce and SCC. The dependent variable was the integrated supply chain performance. Therefore, the key themes relating to the research model from the literature review were conducted as codes (see Table 1) and provided an empirical foundation for the theoretical discussion in the conclusion.

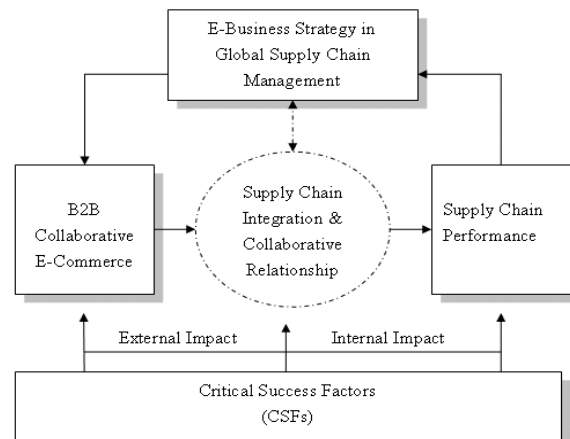


Figure 1: The research conceptual framework

5. RESEARCH METHODOLOGY

As mentioned above, in order to understand the CSFs of interaction between B2B e-commerce application and SCC in this study, the research method must be able to obtain sample details to get close to the research problem and achieve the research objectives.

5.1 Case Study Approach

This research interest requires rich data and multiple sources documenting how SCC members interact and evolve through the use of B2B e-commerce project. The case study method is an appropriate research strategy at the stage of knowledge on a phenomenon in IS studies [5].

5.2 Sample Selection

The main samples were drawn from the Taiwan's IT firms, which had all already implemented the B2B e-commerce projects and formed alliances with IAEBP. The main sample is composed of six international companies, selected and analyzed from their major perspective of e-business strategy. (see Appendix and Table A)

5.3 Data Collection Techniques

The major method of data collection in this study is through in-depth interviews and focus group with managers in each company. Most of the interviews were conducted with MIS project managers in charge of related e-commerce projects. Whenever possible, managers of others department

(e.g. R&D, sales, logistics, purchasing) were also interviewed. Furthermore, in addition to gaining greater understanding of B2B e-commerce projects, interviewing government agents and e-business consultants also provides useful information and advice. Supplementary data will be also collected from other sources, such as company records, to gain background information and further corroborating evidence.

5.4 Methods of Data Analysis

In case study analysis one useful strategy is to adopt a coding system [34]. The case analysis included searching for patterns and relationships among the data using a qualitative analysis software tool - NVivo. NVivo is used to conduct sophisticated data coding as well as supporting several ways to build theories and models. NVivo also assisted in the qualitative coding approach to analyze and code data. Initially a list of codes was developed which originated from the unit(s) of analysis. Each code as a key theme is given an abbreviation and definition (see Table 1).

Table 1: List of codes for the key themes and definition

Key Theme: E-business Strategy (EBS)	Abbreviation	Definition
EBS: INDUSTRY POLICY	EBS_IP	• How the IT industry policy affect the firm's e-business strategy
EBS: STRATEGY	EBS_STRA	• The factors of e-business strategy
EBS: COLLABORATION	EBS_COLAB R	• The factors of supply chain collaboration
EBS: RELATIONSHIP	EBS_RLSP	• E-business strategy impact on supply chain relationship
EBS: COMPETITIVE ADVANTAGE	EBS_CA	• E-business strategy impact on competitive advantage
EBS: INFORMATION TECHNOLOGY	EBS_IT	• The types of IT/IS (e-business project) to adopt and implement
EBS: SUPPLY CHAIN MANAGEMENT	EBS_SCM	• The structure and relationship of IT industry supply chain
EBS: CRITICAL SUCCESS FACTORS	EBS_CSF	• The CSFs of e-business and supply chain collaboration

6. FINDINGS

The six cases by a cross-case analysis of the themes relating the research model constructs were conducted by NVivo. Drawing on the research findings, it is considered imperative to identify the internal and external CSFs for the successful implementation of B2B e-commerce projects in SCC that are discussed in following sections.

6.1 Competitive Environment

The competitive environment is considerable as a significant factor related to strategic e-business management. The findings indicate that the environmental competitive factors have results in more complex supply chain operations and

relationships. This phenomenon often affects the firms to rethink their e-business strategies and SCC.

Competitive pressure in a global marketplace has greatly changed the traditional nature of the supply chain. Organizations are facing competitive pressures to reduce costs and time to market, and increase product innovation and service quality. This motivational factor is consistent with Govil and Proth [13]. However, rapid technology development and the change of customer demands make competitors' action even more unpredictable. Furthermore, the organizations need to be both efficient and effective in how they manage and fulfill their customer requirements worldwide. An Operations Manager in Case E said that:

"We do find that there is a global marketplace for buying, selling, collecting and engaging in global competitive business. Competitors are likely to be radically different from our company, since they may have lower cost advantages and offer customers unanticipated product features. We must be ready to design competitive e-business strategies that will succeed against global rivals."

Therefore, the firms need policies, procedures and systems to deliver effectively. These three factors need to be sufficiently flexible in order to respond effectively to customers. The majority of the case firms agreed that the development of global SCM has become a necessity to promote competitiveness. Hsu and Chiang [19] and Lin and Hsu [24] all are in line with this claim. For example, to implement multinational, integrated information systems, organizations must develop and adopt global hardware, software and communication standards; create cross-organizational and cross-functional teamwork and networks; and redesign the organization structure to fit global business processes. The MIS Manager in Case C mentioned that:

"The organization must provide sufficient flexibility to respond to changing global market conditions, while generating the information necessary to implement the firm's e-business strategy. Because of that, the top managers will finally consider how to restructure the firm as a global business organization."

According to the resource-based view, sustaining one organization's competitive advantage is achieved by continuously developing existing and creating new capabilities and resources in response to rapidly changing market environments and conditions [41]. However, Christopher and Peck [8] argue that, in order to compete in the supply chain network, the aim should be to maximize collaborative advantage rather than competitive advantage in its traditional and single-firm meaning. To achieve collaborative advantage and leverage, the collective competences and skills across the network means that knowledge must be shared and harnessed. A similar view is also

held by the IT Managers in Cases C and E. Collaborative SCM might result in more competition among market competitors.

6.2 Government Involvement

To encourage e-business diffusion, a government can provide supportive infrastructure, legislation, funds, industry policies and regulatory frameworks. In particular, small firms (e.g. SMEs) have lack skills and have fewer resources to facilitate adoption than do large firms. The MIS Project Manager in Case C described:

“Government is a supporter and a server to build a ‘communication platform’ for implementing these projects. Particularly for our small suppliers to gain financial support and e-business consultation.”

The government needs to continue to play the role of catalyst, accelerator and promoter with particular regard to e-industry policy. Hsu and Chiang [19] also agree that the role of the government is to build a comprehensive e-business environment and assist industry to utilize ICT technology to improve its e-commerce applications. In the environment construct, initiators exercise power and promote e-commerce standards in the process of B2B integration. For example, RosettaNet is establishing common definitions for data and business process and communication in the SCC. In addition, some IT project managers have suggested that it is necessary, via the government e-industry policy, to build a collaborative e-marketplace for the local IT industry. The Operations Manager in Case E indicated that:

“Governmental agencies should find it necessary to regulate e-commerce, to establish a clear, comprehensive, and straightforward regulatory environment for the attainment of such objectives as the RosettaNet.”

6.3 Business Profitability

Sabherwal and Chan [28] and Chan et al. [6] argue that the alignment between business strategy and IS strategy is widely believed and demonstrated to improve business performance. Both of their viewpoints support our case data, leading us to believe that e-business strategies play an important role in improving organizational performance. The Operations Manager in Case C strongly agrees:

“E-business strategy used to be focused on implementing technologies that align with and support the organization’s business strategies. It is therefore necessary for an evaluation of the firm’s IS to consider not only the existing context, but also the evolving needs of the organization. For example, the organizational performance and business profitability need to be improved.”

According to the findings in the case data, reducing the costs of a supply chain may have a major impact on firms’ profitability. Collaborative

B2B e-commerce systems can be used to achieve the lowest operational cost and time. Thus, e-business strategies for reducing cost include: implementation of e-commerce systems; forming strategic alliances and partnerships with key suppliers to reduce cycle times; collaboration or cooperation in new product development; and cross-organizational or functional alliances within the collaborative teamwork to speed up the cycle time of the supply chain. Relevant claim can be found in Schniederjans and Cao [30].

In our findings, the firms adopt B2B e-commerce technologies to help increase sales and services; enhance firms’ ability to have the right product available for customer purchases at the right time. Therefore, firms need to adopt e-commerce solutions which integrate with entire SCC. Davidrajuh [10] and Ross [27] particularly favor this perspective. They identified that the significance of strategic advantage from e-commerce networks and supply chain collaborative integration. The Sales Manager in Case B noted that:

“Obviously the need of e-commerce technology is greatest when the intention is to fully integrate the trading partners. It also plays an important role in the dynamic transaction process, supporting the gradual implementation in the whole supply chain collaboration.”

6.4 Managing Partnerships

Vokurka and Lummus [39] state that trust is the quality that allows collaboration and cooperation to take place within the organization and among the supply chain partners; allowing an outside organization to view transaction-level data places a premium on trust between trading partners because of the competitive risks associated with this type of access. Our case studies find that the key to a seamless supply chain is making available undistorted and up-to-date information at all levels within the supply chain. The trust-based sharing of information within the entire supply chain can create flexibility, but this requires timely, accurate information and secure transactions. The importance of these factors has been identified by Sahay [29].

By developing strategic partnership relationships with suppliers, it is possible to work more effectively with a few important suppliers who are willing to collaborate and share information for the success of products or services. Aligned organizations can work closely together to eliminate wasted time and effort. Stuart and McCutcheon [35] suggest that, typically, low cost is the main driver for partnership relations in SCM. For example, the Case A, Engineering Director mentioned that suppliers in the product design process can make more cost-effective design choices, develop alternative conceptual solutions, select the best components and technologies and help with design assessment to

reach time-to-market. Moreover, the important factor in determining influence is the bargaining power of companies in the SCM, and the level of strategic alignment of organizations involved in the SCC. Ballou et al. [3] provide evidence to support this claim, highlighting that contexts have a significant impact on the role of power for SCC, based on the relationship perspective. One member may be so dominant that others are compelled to act to achieve supply chain-wide benefits. Concerning transaction costs, companies will find more economical ways to own suppliers and distributors in a virtually integrated supply chain [15]. A Sales Director in Case F stated that:

“We can increase market share because of our strong partnership with suppliers and good relationship with existing customers. Of course, low cost is our competitive advantage. Adoption of advanced information systems to connect our business partners is necessary.”

B2B e-commerce systems need to deliver supply chain visibility to the different parties who need to access information about an organization's supply chain. Information from the case findings includes: (1) product and marketing information, catalogues and price data; (2) product delivery information; (3) customer communication, order management and service; (4) supplier communication, data interchange and purchase orders; (5) inventory buckets at suppliers, in transit, receiving docks, work-in-process, finished goods and at distributors; (6) ability to track specific projects, production runs and cycle times; (7) provision of real-time information about all of the above factors; and (8) improved inter-organizational information flow with good B2B systems.

In the future, the demand for collaboration between partners in the supply chain will trend towards strategic alliances as increased network organizations become more common. The case study interviews also reveal that current e-commerce technologies are important in this regard. That being so, the network organization in Case C consists of a complex web of linkages (e.g. e-Hub, e-Marketplace) between focused partners, each of which adds value through specialization in an activity where it can achieve a differential advantage. Thus, strategic alliances or e-supply chain networks for SCC require that the following necessary and sufficient conditions should be considered: (1) information sharing with key trading partners; (2) e-commerce technologies application for B2B integration; (3) collaborative partnership for long-term relationship and trust.

6.5 Customer Satisfaction

In the current environment, customer service is to be viewed as the most important consideration for any firm. This focus on increased customer

satisfaction in both the business-to-business (B2B) and the business-to-customer (B2C) markets has led to many changes in supply chain practice and service approach. Within an SCC context, value is often created between customers and suppliers. Supply chain partners often work together to offer products and services that create value for the multiple organizations involved as well as downstream customers. Customer service is an increasingly important focus of management attention since it creates wealth for the company by adding value for the customer. This challenges the organization that aspires to be a leader in service performance to recognize the customer service requirements of the different segments that it serves and restructure its business processes around the achievement of those service requirements. For instance, in the case of SCC, higher customer value can be delivered through superior logistics performance, enabling customers to serve their customers better but with a smaller inventory (e.g. VMI, CPFR) and lower ordering cost (e.g. e-procurement).

Internet technology has had a significant impact on customer service operations and customer service expectations. Graham and Hardaker [14] argue that: ‘The Internet has become a central part of a commercial drive towards systemic innovation and the re-evaluation by many of value creation’. Customers expect value to be created through both the online purchase experience (e.g. e-procurement, Internet-based EDI) and tracing product delivery status online (e.g. e-logistics). Our case studies indicate that the involvement of B2B e-commerce projects has resulted in much better customer service in practice. This is in line with Woodruff and Gardial [40]. Most interviewees from the case companies felt that firms have invested in e-commerce technologies aimed at producing optimal results: a better supply chain performance in terms of inventory reduction, a reduction in out of stocks, better forecasting and promotion planning and a higher speed of new product development, such as VMI or CPFR systems adopted to improve customer satisfaction.

Furthermore, case firms have also attempted to adopt customer relationship management (CRM) systems for more focused service via process, people and information with their supply chain activities. CRM systems can provide significant improvement in customer-supplier interaction and help customer service personnel capture, recall and use customer-specific data to improve the effectiveness and efficiency of their customer service. A Sales Director in Case E mentioned that:

“The CRM system can help us effectively identify customer problems and needs. It is helping us increase customer satisfaction and loyalty, improve efficiency and service levels, and undertake the

customer demand. The result has been a significant improvement in customer satisfaction.”

6.6 Change Management

In our findings, implementation of an e-commerce system also brings increases in operational efficiency and effectiveness and a chance to re-engineer the business process. Business process re-engineering (BPR) is an activity that involves managing the restructuring of operation processes in an effort to improve efficiency. In fact, integration of business processes is often the justification for many information systems' (e.g. ERP, CRM and SCM) implementation. Relevant claim can be found in Davenport [9] and Chen and Chang [7]. The changes to the firm may be inevitable, and can impact upon virtually every business process or function within the organization. Another the benefit of integration is the creation of SCC which knows customer demand and thus responds quickly to customers. This process is a source of competitive advantage in terms of gaining momentum as the growth of time-based competition accelerates. Through B2B e-commerce application for e-supply chain integration, it is possible to improve inter-organizational level coordination and hence move towards the optimization of the supply chain. Vinum and Skjoldager [38] provide the same viewpoint in this regard. This strategic integration should be considered in line with e-business strategy and technology environments, and short- and long-term business goals. This goal can achieve real time, secure mutual access to the internal company and external trading partners' information (e.g. suppliers, partners and customers), which allows dynamic collaboration. As Vickery et al. [37] noted, integrative IS increases the flow of relevant information among process participants to facilitate the integration of processes that transcend functional and, in some cases, firm boundaries. All participants in SCC can be linked by integrative e-commerce systems that share the information, making the entire value-adding process seamless and more efficient.

6.7 Project Management

Higher management support is crucial for any successful e-commerce project in the organization. To implement e-business solutions successfully, the main managers must understand and monitor significant problems that affect project performance, provide directions to the project teams and establish clear priorities to achieve e-business strategy. This critical factor is consistent with the views of Slevin and Pinto [32] and Lertwongsatien and Wongpinunwatana [23]. They perceive this critical path layout as being important and relevant to successful e-commerce project implementation. The MIS Project Manager in Case C stated that:

“To successfully manage complex projects, the willingness of higher management is needed to support the project team and stay close to these activities so that the organization can develop a core competency in doing these projects well and removing the organizational barriers.”

However, a project team is the integration of different skills, knowledge, people and organizations to perform a complex project. People from various functional units cooperate by contributing their individual knowledge and skills. The MIS Project Manager in Case C commented:

“The composition of the team is very important because the various backgrounds and know-how of each member in a collaborative teamwork must be considered clearly.”

Some successful e-commerce projects depend on the capabilities and experiences of the consultants because the consultants have greater proficiency and in-depth knowledge of the software. Overall in case data, most managers would agree that having the right consultants involved in their e-commerce project implementations improves the probability of having a successful project. They provide a very valuable service by filling gaps, and providing expertise and collaborative project implementation. Greiner and Savich [16] make it clear that ‘if you are in a business of change one of the best and most costless approaches to change is through consulting expertise’. In addition, cultural diversity also deeply affects the collaboration among project team members. For instance, multicultural teams will face the problems of language, conflict, cohesion and loss of trust issues. The MIS Project Manager in Case D observed that:

“Cross-cultural cooperation is significantly more demanding than communication in a single culture, because culturally different individuals have less common information and understanding affecting project success.”

6.8 Knowledge Management

Knowledge management plays an important role within e-business strategy since SCC success is critically dependent on diffusion of knowledge and innovation in all aspects of the organizational learning and external environment collaboration. The case data reveal that many firms are now more open and amenable to sharing knowledge and communicating ideas with their supply chain partners. Strong relationships usually effect a close interaction and cooperation between alliance partners and thus facilitate the exchange and transfer of knowledge across the interface of alliances. This is in line with Dhanaraj et al. [12] and Desouza [11], who claim that the effective management of knowledge that is strategic for the inter-organization and which needs to be managed for competitiveness varies

depending on the business context and the value of different types of knowledge associated with it. Organizations following such a strategy coordinate efforts, ensuring local flexibility while exploiting the benefits of global supply chain integration and efficiencies, as well as ensuring worldwide diffusion of innovation. The MIS Project Manager in Case D stated that:

“For a successful e-commerce project implementation, frequent communication and knowledge sharing are critical activities. A lot of the knowledge transfer and sharing takes place during discussion between team members.”

B2B e-commerce technology is both a key facilitator and a major limitation to knowledge sharing within firms and between trading partners. It holds the promise of allowing global supply chains to realize significant gains through end-to-end knowledge sharing. For example in our cases, radio frequency identification (RFID) technology allows an incredible amount of knowledge to be captured and shared across a global supply chain. RFID also provides tracking information that gives buyers real-time visibility of the precise composition and location of shipments. The Logistics Manager in Case F said that:

“Buyers and suppliers need to come closer together to develop the true potential of RFID technology, by expanding beyond the collaborative efforts. From improvements to vendor purchasing plans that result in better sales forecast and more complete financial planning, the sharing of merchandise plans and special event information can only help all players across the network to improve operating costs and better satisfy the ultimate customer.”

The findings of SCC ensure that systematic cross-functional communication and knowledge transfer improve knowledge management efficiency, effectiveness and innovation diffusion. Relevant claim can be found in Soliman and Youssef [33]. They also point to the significant role of knowledge management in improving product development in an e-commerce setting. Their viewpoints identified how e-commerce can support product development by examining the impact of the integration of SCC with the stage-gate product development system on supporting and accelerating new product development.

7. CONCLUSION AND FUTURE WORK

There are many factors behind the successful e-business strategy in the study of SCC. B2B e-commerce technology provides integration

/collaboration application services that enable trading partners to limit investment in developing, maintaining and supporting the complex environments required to collaborate with numerous companies across various networks. When aligned with e-business strategies, B2B e-commerce technology helps firms reduce inefficiency, costs, and uncertainty of supply chain operations, thus resulting in improved business profitability and customer services. With regard to e-supply chain integration, firms need to develop better partnership relationships with trading partners through continuous collaboration with trading partners (e.g. suppliers, customers or third parties), thus building trust-based alliances.

In order to approach the CSFs of B2B e-commerce and SCC, the findings suggest having complementary viewpoints of e-business strategy in SCC. However, recognizing the potential important of the impact of the case studies, the work suggests that firms pay more attention to realize and identify strategic factors of SCC when they attempt to adopt IT/IS to have an effective B2B e-commerce plan. Following the claim by the results indicate that different CSFs impact on corresponding e-business strategies, and could initiate emerging SCM practice. In this regard, both the external competitive market environment and the internal organizational factors impacting on the success of SCC should be considered. In addition, the result is to generate a greater understanding and meaning of the phenomenon within the SCC. It has used analytical generalizations to develop a theoretical perspective from the investigation, and the emerging model adapted from the empirical case study research provided a research framework for e-business strategy in SCC.

This research compliments previous studies by systematically examining the impact of B2B e-commerce on SCC. Future quantitative research would provide more detailed results and enable statistical testing and measurement of the impact of the different factors considered in this study. In addition, there is a need for more work to see what benchmarks are used by different disciplines, such as conflict management, marketing, green supply chain, channel management, SMEs, supply chain relationship, network and ICT studies. A comparison needs to be made between the various industries to understand whether the CSFs are similar or different across industries and sectors. Such a study could help various industries develop collaborative supply chain strategies that lead to competitive advantage and e-business success.

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APPENDIX

Table A: Case study profiles

Case Name	Case A	Case B	Case C	Case D	Case E	Case F
Business Region	Global	Global	Global	Global	Global	Global
Business Type	OEM/ODM	OEM/ODM	OEM/ODM	OEM/ODM/OEM	OEM/ODM	OEM/ODM
Main Products	LCD TVs and monitor, digital consumer, information and communication system integration, network-connected devices and home appliances.	Desktop PC systems, Tablet PC, PDA, Bluetooth dongle, laptops and PC peripherals.	SmartPhone ,PDA,GPS , Networked multimedia servers and storage systems, LCD TV, Network computers, PC motherboard and laptops.	Barebone PC, Desktop PC and Laptop, LCD monitor, Motherboard, Servers, Peripherals, PC components, Mobile phone, Networking, Multimedia.	LCD TVs and monitor, Laptops, WiFi MP3, Digital Media Adaptor , Portable Media Player and upcoming Digital Home Products.	Mobile phone, Desktop systems, Servers, Storage, Networking, IA, Laptop, Communications.
E-Project Beginning and Ending Time	2000 - 2004	2000 - 2004	2000 - 2004	2000 - 2004	2000 - 2004	2000 - 2004
Respondent	IT/MIS Project Manager (n=2) Engineering Manager/ Director (n=1) Sales Manager / Director (n=1) Purchasing Manager / Director (n=1) Operations Manager (n=1) R&D Director (n=1)	IT/MIS Project Manager (n=1) Engineering Manager/ Director (n=1) Sales Manager / Director (n=1) Purchasing Manager / Director (n=1) Logistics Manager (n=1) R&D Director (n=1)	IT/MIS Project Manager (n=1) Engineering Manager/ Director (n=1) R&D Director (n=1)	IT/MIS Project Manager (n=1) Engineering Manager/ Director (n=1) Sales Manager / Director (n=1) Purchasing Manager / Director (n=1) Logistics Manager (n=1) R&D Director (n=1)	IT/MIS Project Manager (n=2) Sales Manager / Director (n=1) Purchasing Manager / Director (n=1) Operations Manager (n=1) R&D Director (n=1)	IT/MIS Project Manager (n=1) Engineering Manager/ Director (n=1) Sales Manager / Director (n=1) Purchasing Manager / Director (n=1) Logistics Manager (n=1) R&D Director (n=1)
Dept. of Duty	MIS Department	MIS Department	MIS Department	MIS Department	MIS Department	MIS Department

企業電子化策略在供應鏈協同合作： 台灣企業對企業電子商務專案的實證研究

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摘要

隨著全球經濟的發展與日益增長的國際競爭，供應鏈協同合作(Supply Chain Collaboration, SCC)已成為企業重要的營運策略議題。組織必須重新思考它的企業電子化(Electronic Business, E-Business)策略與全球供應鏈管理(Supply Chain Management, SCM)策略。本研究調查台灣資訊產業應用企業對企業電子商務(Electronic Commerce, E-Commerce)技術達成電子化供應鏈的協同整合。主要目的是探討企業電子化策略的關鍵成功因素(Critical Success Factors, CSFs)對供應鏈協同合作的影響。本研究主要採質性個案研究方法，調查與分析具代表性六家台灣國際企業，此個案公司皆參與政府支持的「產業自動化和企業電子化計畫」，並實施導入企業對企業電子商務專案計畫，達成電子化供應鏈的協同合作。個案資料採電腦輔助質性資料分析軟體- NVivo 編碼與分析。本研究提出的概念架構將用於分析的結果與討論，並經由跨個案分析的結果，將關鍵成功因素進行分類、討論協同合作的議題，以了解個案公司成功導入企業對企業電子商務專案的影響。研究結果與發現將提供學術和實務界對電子商務策略與供應鏈協同相關議題的參考。

關鍵詞：供應鏈協同合作、供應鏈管理、電子商務、企業電子化策略、關鍵成功因素
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