

E-Business Model Design and Implementation in Supply-Chain Integration

Ming-Chang Lee, Mei-Wen Han

Department of Information Management, Fooyin University, Taiwan, R. O. C.

Email:ming_li@mail2000.com.tw , sc022@mail.fy.edu.tw

Abstract -- Supply chain integration methodologies have been increasing as a consequence of the globalization of production and sales, and the advancement of enabling information technologies. In this paper, we explore concepts like business-to-business cooperation, e-service aggregation, and dynamic re-configuration of business roles. The framework of e-business impact on supply chain integration is discussed.

Index Terms—Business model, E-process, E-networks, E-services, E-commerce, Supply Chain Integration, E-business

I. INTRODUCTION

Supply chain is a network of facilities and distribution operations for the entire network of companies to work together to design, produce, deliver, and service products. Traditionally, marketing, distribution, planning, manufacturing, and the purchasing organizations along the supply chain operated independently. These organizations have their own objectives and these are often conflicting. Clearly, there is a need for a mechanism through which these different functions can be integrated together; supply chain management is a strategy through where such integration can be achieved [17]. The major objectives of supply chain management are trying to integrated information flows and physical flows well between each role on the chain which maybe include customers, suppliers, manufactures, wholesalers, retailers, consumers etc. Information technology has been slowly adopted in the electric industry due to factors such as the lack of standards. Therefore, Wei [22] develop standardized e-business solutions in the electric industry. MaInness [13] suggests a new framework for business models that takes into account disruptive technologies. Business models are defined as summary of the value creation logic of an organization or a business network including assumptions about its partners, competitors and customers. E-business is defined as Internet-mediated integration of business, applications, and information systems [9]. E-business is considered as a new business model that emerging in the web-driven environment and has descended across the corporate world. All companies involved in the e-network interact directly in order to achieve the business goal established the creators of the e-network itself.

This purposed research will focus on the

relationship between the cooperation process and the e-process of the companies including in an e-network is central to the e-service world. E-business model framework and business model design and implementation are discussed. The finding may assist practitioners to devise an appropriate knowledge management strategy to support their firm's operations.

II. SUPPLY CHAIN MANAGEMENT AND SUPPLY CHAIN INTEGRATION

Supply chain is the integration of key business process from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders. Supply chain management means coordinating, scheduling and controlling procurement, production, inventories and deliveries of products and services to customers. Stadler [19] provides a synthesized definition of SCM stating that it is a process of integrating organizational units along a supply chain and coordinating materials, information and financial flows in order to fulfill customer demands with the aim of improving competitiveness of supply chain as a whole. From the above definition, we define SCM as the collaborations and cooperation of firms across the entire supply chain in order to improve operational efficiency and market competitiveness. Therefore, Supply chain efficiency means having the right product at right place at the right time, can save money/reduce costs, and can enhance cash utilization.

Lee and Whang [11] divide the various forms of e-business applications into three categories: e-commerce, e-procurement, and e-collaboration. E-commerce helps a network of supply chain partners identify and respond quickly to changing customer demand captured over the Internet [8]. E-procurement allows companies to use the internet for procuring direct or indirect materials, as well as handling valued-added services like transportation, warehousing, customers clearing, payment, quality validation, and documentation. E-collaboration facilitates coordination of various decisions and activities beyond transactions among the supply chain partners, both suppliers and customers, over the Internet (e.g., coordination of engineering changes in the bill-of-materials for a product that is manufactured by an outsourced partner). There is much pre-web-related research on information technology and supply chain management.

III. E- BUSINESS MODELS

Definitions of business models are wide and broad like a flow diagram connecting all the elements of a value chain linking process, distributors and consumers, showing the flow of goods and services in one direction and the flow of money in the other [4]. Joyce and Winch [6] draws upon the emergent knowledge of e-business model together with traditional strategy theory to provide a simple integrating framework for the evaluation and assessment of business models for e-business. Timmers [20] proposed a business mode, it elements of a business model are (1) the business

The importance of business models arises from at least four purposes. Firstly, in an early phase they serve as a structured approach to guide idea generation. Secondly, they are required as planning tools to define a business plan and implement it. Thirdly, they are a communication tool to initiate action internally, with partners, customers and other stakeholders. Finally, due to their compact nature business models facilitate comparison between companies. Figure 1 is denoted as business structure and E-business model. In Figure 1, we define the Business architecture, Rule & Process, IS architecture, and Potential benefit.

(1) Business architecture: Business architecture describes the value creation of the product and/or service offered by describing the logistics, finance and information flows. (2) Rule & Process: Rule & Process describe the logic the business is based on. Rules include the business logic [3] as well as the underlying assumptions and beliefs in impact diagrams. (3) IS architecture: IS architecture is a supportive but constituting element to enable the business architecture and business rules (process) for e-services. It contains two elements to facilitate standardization [14]. The business bus defines the set standards for data – XML, for protocols – SSL, process and interface requirements. (4) Potential benefit: Potential benefit is described by listing quantitative (time and cost) and qualitative (flexibility, quality, knowledge) elements. It addresses partnership behavior and win-win analysis [2]

A. E-commerce

E-Commerce consists of the buying and selling of products or e-Process over electronic systems such as the Internet and other computer networks. The amount of trade conducted electronically has grown extraordinarily since the spread of the Internet. A wide variety of commerce is conducted in this way, spurring and drawing on innovations in electronic funds transfer,

architecture for product, service and information flows (2) description of potential benefits (3) description of the sources of revenues. Business model are defined as summary of the value creation logic of an organization or a business network including assumptions about its partners, competitors and customers. Wald and Stammers [21] proposed a model for e-businesses based on the separation between standard processes and e-processes. A distinction between Internal and External processes could to a definition of e-processes as the external processes involving the Internet [20].

supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, and automated data collection systems. Modern electronic commerce typically uses the World Wide Web at least at some point in the transaction's lifecycle, although it can encompass a wider range of technologies such as e-mail as well.

A small percentage of electronic commerce is conducted entirely electronically for virtual items such as access to premium content on a website, but most electronic commerce involves the transportation of physical items in some way. Online retailers are sometimes known as e-tailors and online retail is sometimes known as e-tail. Almost all big retailers have electronic commerce presence on the World Wide Web. Electronic commerce that is conducted between businesses is referred to as Business-to-business or B2B. B2B can be open to all interested parties (e.g. commodity exchange) or limited to specific, pre-qualified participants (private electronic market). Electronic commerce is generally considered to be the sales aspect of e-business. It also consists of the exchange of data to facilitate the financing and payment aspects of the business transactions.

B. E-procurement

E-procurement (electronic procurement, sometimes also known as supplier exchange) is the business-to-business or business-to-consumer purchase and sale of supplies and services through the Internet as well as other information and networking systems, such as Electronic Data Interchange and Enterprise Resource Planning. Typically, e-procurement Web sites allow qualified and registered users to look for buyers or sellers of goods and services. Depending on the approach, buyers or sellers may specify costs or invite bids. Transactions can be initiated and completed. Ongoing purchases may qualify customers for volume discounts

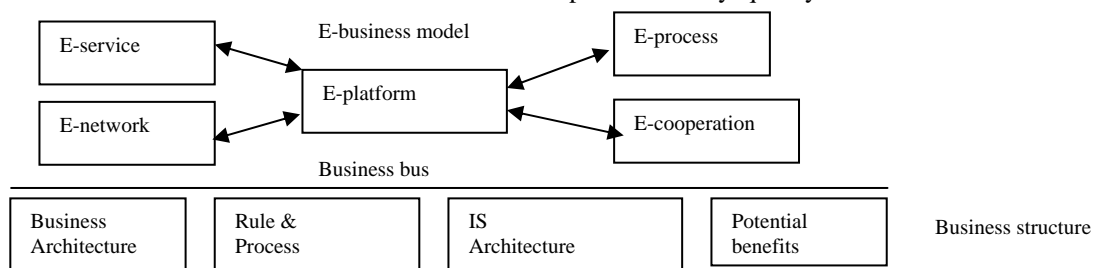


Figure 1: Business structure and E-business model

or special offers. E-procurement software may make it possible to automate some buying and selling. Companies participating expect to be able to control parts inventories more effectively, reduce purchasing agent overhead, and improve manufacturing cycles. E-procurement is expected to be integrated with the trend toward computerized supply chain management. For example, [7] explore why some firms are successful with e-procurement strategies. Pyke and Johnson [16] compare many e-procurement strategies to traditional strategic alliance. Lee and Whang [10] model how secondary on-line markets impact the supply chain.

C. E- Cooperation (E- collaboration)

E- Cooperation is based on three levels of abstraction: cooperative framework, cooperative process, and cooperative step. A cooperative process is a process meant to orchestrate the execution of a specific aspect of the cooperation between a numbers of business partners ([1], [15]). The elements of a process are mainly represented by cooperative steps required to specific of roles ([12], [25]). A cooperative set is an atomic unit of activity inside a cooperative processes. It can involve a single role, or it can require the coordination of two or more of roles.

E-services defined as internet-based applications and services which are offered as individual products to solve a specific business need that seamlessly integrates with the customer's processes. E-services may build a new infrastructure to facilitate entrepreneurship and seizing opportunity. E-services focus on the way in which the value generated by a company can be offered to other businesses and customers ([15], [23]). On the supply side, e-services propose a common approach to aspects like description, discovery, and negotiation of the products generated by an e-business. On the demand side, e-service offer a new way of acquiring business and capabilities. The e-service offer of an e-business emerges from the customer interaction elements of the e-process implemented by the company.

D. E-service and E-process

The e-service offered of an e-business emerges from the customer interaction elements of the e-processes implemented by the company. E-process is any business process sustaining the operational aspects of an Internet-centered business model. Each process in an e-business is an e-process, our aim is to stimulate a more careful analysis of business processes and content of processes rather than the type of technology involved. The entire company has to align behind new e-business models, and this is the principle that we try to capture with the definition process for e-business ([5], [12]). E-processes can exploit the potential of a supply chain based on e-service.

E. E-network

E-network is any set of e-service cooperating in accordance with the specifications coming from a set of cooperation processes. The composition logic for the parties involved in the e-network derives from the e-processes of the company that define the e-network. All the companies involved in the e-network interact directly in order to achieve the business goal established by the creators of the e-network itself. More business-centric scenarios picture e-services composing with e-processes to support the operations of a specific company.

IV. BUSSINESS MODEL DESIGN AND IMPLEMENT

From the above statements, summarizes the impact of e-business on supply chain management is e-collaboration, e-procurement, e-network, and e-service. There are five key dimensions in which the impacts can be found: Information Integration, Synchronized Planning, workflow Coordination, New Business Models, When customer relationship management becomes critical to business success, Customer Relationship Management (CRM) applications are viewed by organization as a key vehicle to building long-term customer relationship and achieving competitive

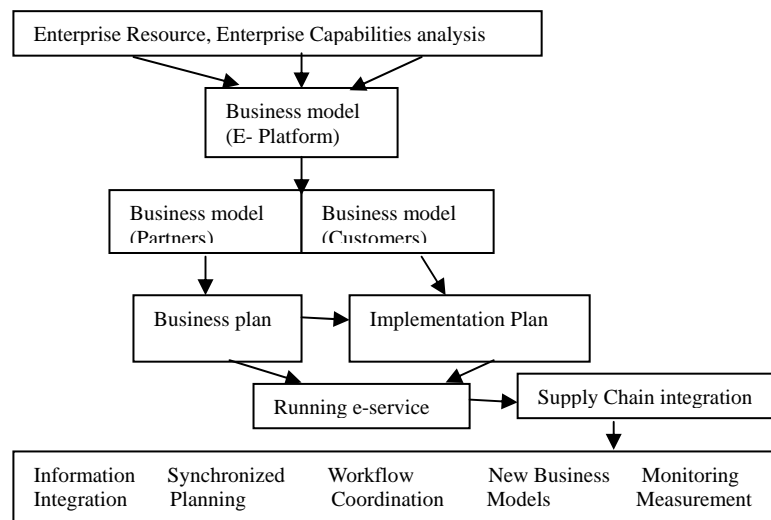


Figure 2: The framework of e-business impact on supply chain integration and e-business process

advantages ([25]).

Figure 2 is the framework of e-business impact on supply chain integration and e-business process. The roles of e-service providers on different content levels, e-procurement, e-collaboration, e-network will be analyzed. Next to the further application of the framework, the forming of the business model for the network, the process of transforming the business models into business plans, communicating it to customers and finally turning it into running s-services. This should lead to insights on how business models support successful practices for defining business plans for supply chain management. The operation of supply chain integration is information integration, synchronized planning, workflow coordination, new business models and monitoring and measurement.

V. CONCLUSION

E-business has been a powerful and compelling enabler of supply chain integration across a wide range of industries. As a result of e-business, many of the core supply chain concepts and principles have been put in practice in a much more effective way. These concepts include: information sharing, multi-party collaboration, design for supply chain management, postponement for mass customization, outsourcing and partnerships, and extended or joint performance measure. In this paper, it presents the business structure and e-business mode in order to explore concepts like business-to-business cooperation, e-service aggregation, and dynamic re-configuration of business roles. A Business Model Design and Implementation framework is discussed. This should lead to insights on how business models support successful for defining business plans.

REFERENCE

- [1] Chen, F. Z., Ryan, J. K., and Simchi-Levi, D., Quantifying the Bull ship Effect in a Simple Supply Chain: The Impact of Forecast, *Management Science*, 46(3), 2000, pp. 436-443.
- [2] Doyle, M. and Parker, B., Achieving Supply Chain Excellence by Balancing e Economics of Production with the Economics of Cooperation, *Achieving supply chain excellence through technology*, 1999, pp. 244-247.
- [3] Drucker, P. F., *Theory of business*, Harvard Business Review, 72(3), 1994, pp. 95-104.
- [4] Frezza, B., It's Time to Examine Your Company's E-business Model, *Internetweek*, 22(6), 1998, p. 42.
- [5] Huang, G. Q., Zhang, X. Y. and LO, H. Y., Optimal supply chain configuration for platform products: impacts of commonality, demand variability and quantity discount, *International Journal of Mass Customization*, 1(1), 2005, pp. 107-133.
- [6] Joyce, P. and Winch, G. W., An e-business design and evaluation framework based on entrepreneurial, technical and operational considerations, *International Journal of electronic Business*, 3(2), 2005, pp. 198-214
- [7] Jap, S. and Mohr, J. J., Levering Internet Technologies in B2B Relationships, *California Management Review*, 44(4), 2002, pp. 24-38.
- [8] Johnson, M. E. and Meller, R. D., Performance Analysis of Spilt-Case Sorting Systems, *Manufacturing and Service Operations Management*, 4(4), 2002, pp. 258-274.
- [9] Kalakota, R. and Robinson, M., *e-business: Roadmap for success*, Reading, MA: Addison Wesley, 1999
- [10] Lee, H. L. and Whang, S., The impact of the Secondary Market on the Supply Chain, *Management Science*, 48(6), 2000a, pp.719-731.
- [11] Lee, H. L. and Whang, S., *Supply chain Integration over the Internet in Supply Chain Management: Models, Applications and research Directions*, 2002.
- [12] Lin, B. W., Cooperating for supply chain effectiveness: manufacturing strategy for OEMS, *International Journal of Manufacturing Technology and Manager*, 5(3), 2003, pp. 232-245.
- [13] MacInnes, L., Dynamic business model framework for emerging technologies, *International Journal of Services Technology and Management*, 2005, 6(1), pp.3-19.
- [14] Osterle, H. Fleisch, E. and Alt, R., *Business Networking Shaping Enterprise Relationships on the Internet*, Springer, Berlin, 2000.
- [15] Pujawan, I. N., Assessing supply chain flexibility: a conceptual framework and case study, *International Journal of Integrated Supply Management*, 1(1), 2004, pp. 79-97.
- [16] Pyke, D., Johnson, M. E., and Desmond, P., E-fulfillment: Its Harder Than It Looks, *Supply Chain Management Review*, 5(1), 2001, pp. 26-32.
- [17] Ram, G., Terry, P. H., *An introduction to supply chain Management*, Department of Management Science and Information Systems, Penn State University, 2002. http://silmaril.smeal.psu.edu/misc/supply_chain_intro.html.
- [18] Sohal, A. S., Power, D. J. and Terziovski, M., Integrated supply chain management and B2B e-commerce practices in Australia – a retailers perspective in implementing the EAN system, *International Journal of Business Performance Management*, 4(2-4), 2002, pp. 218-230.
- [19] Stadtler, H. (2000), *Supply Chain Management – An Overview*, *Supply Chain Management and Advanced Planning Concepts, Models, Software and Case Study*, Germany, Springer-verlag, pp. 7-27.
- [20] Timmers, P., Business models for Electronic Markets, *EM-Electronic Markets* 8(2), 1998, pp. 3-8.
- [21] Wald, E. and Stammers, E., Out if the alligator pool: a service-oriented approach to development, *EAI Journal*, March, 2001, pp. 26-30.
- [22] Wei, J., Platt, R., White, B., Jasquith, A. P., Developing of standardized e-business solution via e-chain analysis in the digit utility, *International Journal od Services and Standards*, 2006, 2(2), pp. 117-136.
- [23] Weixin, Y., Logistics network structure and design for a closed-loop supply chain in commerce, *International Journal of Business Performance Management*, 7(4), 2005, pp. 370-380.
- [24] Zhang, H., Vertical Information Exchange in a Supply Chain with Duopoly Retailers, *Production and Operations Management*, 11(4), 2002, pp. 531-546.
- [25] Zheng, S., Yeh, D. C., Havelka, D. and Ku, C. Y., The integrative role of CRM and SCM *International journal of information Technology and Management*, 1(1), 2002, pp.50-68