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Study on Manufacturer Supply Chain Management Based on B2b E-marketplace

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Abstract: B2B e-marketplace provides powerful IT support to enterprises implementing Supply Chain Management (SCM). A supply chain information exchange structure based on B2B platform shares information to all the enterprises on the nodes of supply chain and tightens their connection. The overall operation efficiency of the entire supply chain is then improved. An enterprise may introduce B2B e-marketplace to improve operation efficiency of supply chain, promote e-business comprehensively and change its management style of supply chain.

Key words: B2B, e-business, SCM

INTRODUCTION

The world saw great development in B2B e-marketplace with the progress of information technology. In this study, the term B2B e-marketplace, which defined the platform, is a broad definition of an internet-based market involving buyers, suppliers and agents. B2B e-marketplaces are regularly constructed by third-party organization or corporation, open to all participants, with minor qualification requirements. The level of information sharing and collaboration for participants is low in such a place (Oh and Kim, 2011).

Many companies try to transform to the platform-based B2B e-commerce business model (Nie *et al.*, 2012; Quaddus and Hofmeyer, 2007). The role of B2B e-marketplace in the supply chain management is critical to the success of delivering products and services to customers. Nowadays, about 9200 B2B e-business service enterprises emerged in China. There are currently more than 14 million small and medium-sized enterprises using B2B e-marketplaces. Their competitiveness is more tightly related to the electronic networks with customers, suppliers and partners. Some leading e-marketplaces already have a well-developed strategy for reaching a particular business, based on service needs.

According to “2012 China E-business Market Data Monitoring Report” issued by China E-business Research Center, in year 2012, the trading volume of Chinese e-business market reached 10.69 trillion yuan. 5.4 trillion of them was from trading in B2B market. Seen from the number of enterprises involved, trading volume, information exchange scope, one can clearly tell that B2B e-marketplace has become the major form of e-business. With the development of B2B e-marketplaces, supply chain operations keeps getting critical for effective competition.

A B2B e-marketplace is not a simple gathering of sellers and buyers on the website, but more like the basis for related enterprises to establish strategic partnerships (Fig. 1). The e-marketplace is a kind of electronic marketplaces, neutral internet-based intermediaries that focus on one specific industry or business processes. It employs various market-making mechanisms to mediate the transactions among businesses. Regular B2B e-marketplace adopts three-tier framework to stay in consistency with widely used e-business application architecture for information integration (Zhao *et al.*, 2010).

The information on the network is easily accessible to all the members. Any related enterprises can establish their own cooperation and conduct marketing, production and operations through the network, to form horizontal or vertical business integration. The e-marketplace provides them a ideal conduit to realize the larger goals, gain stronger power, operate with more efficiency and explore larger market (Liu, 2011). Studies indicated that changes in organizational characteristic (such as IT infrastructure), environmental characteristics (such as the utilization of e-business in the industry) and perceptions of e-business (risk and benefit) posed their long-term influences to the movement along the reutilization trajectory (Banerjee and Ma, 2012).

Being a business model with well-development and under long-term application, the B2B e-marketplace can bring outstanding profits to participating enterprises: One of them is direct e-business between two enterprises (such as online purchase and supply of man. It generates the profits from the reduction of expenses caused by applying low cost information exchange and the efficient integration of supply chain and value chain. There are two basic models of B2B e-business (manufacturers). The other one is running e-business activities through a third party platform with many participants.

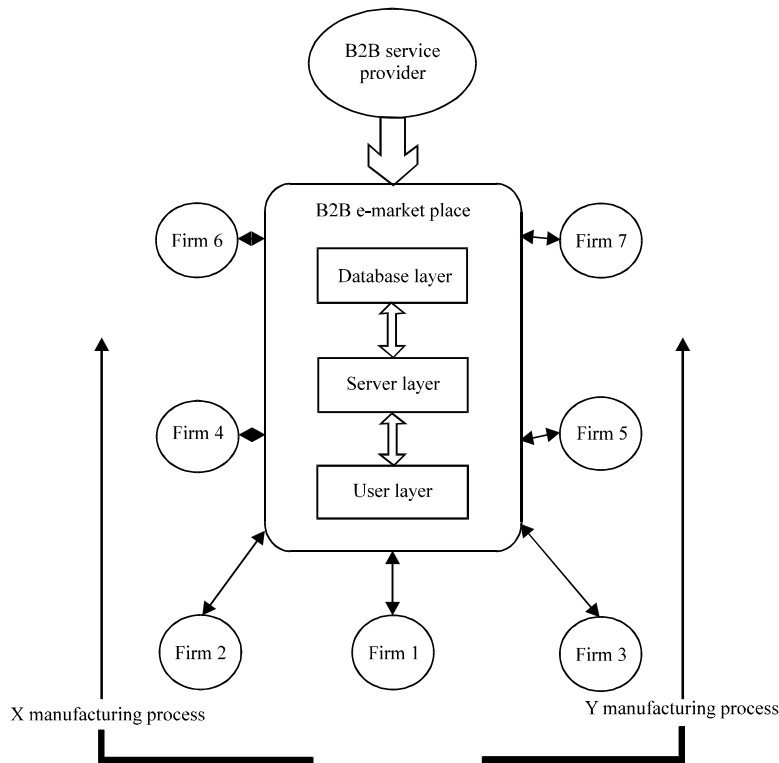


Fig. 1: B2B e-marketplace architecture

This study focuses its study the second model, in which participants do trading on an e-business platform provided by a third party (Dan *et al.*, 2012, Jiao *et al.*, 2011).

The value chain of B2B e-marketplace is consisted up with three parties. The first is e-business platform supplier that provides basic structures, encrypted certification and technical platform. The second is service provider including application servers, content providers and trading communities. The third one, known as the system integrators, are also involved into every period, providing system integration technologies or assistance to reconstruction of businesses flows, to participating enterprises for better services. By providing stronger IT support for SCM, B2B e-marketplace has changed the operation models of many nodes in supply chains, promoted reformation of SCM ideas and strengthened the functions of virtual supply chains. They all contributed to a more efficient and integrated SCM.

SCM scientifically integrated the process of purchasing necessary raw materials for further products and services in a corporation, with supplement to its customers. It was later deeply affected by B2B e-marketplace. Its significant is that the B2B e-marketplace provides powerful IT support for enterprises to conduct

SCM. It not only shares information to all enterprises on the nodes of the supply chain and tightens their connection, but also enhances the efficiency of overall operation of the supply chain. In the era of e-business, a supply chain exhibits multiple characteristics including virtualization of enterprise value chain, network-based management of customer order, studyless of material purchase and production. It is now of great theoretical and practical value to make good use of B2B e-marketplace in solving information flow problems of supply chain.

MANUFACTURER SUPPLY CHAIN BASED ON B2B E-MARKETPLACE

Overviews of SCM on B2B e-marketplace”: Multiple preliminary researches had been done regarding supply chain based on the B2B e-marketplace. Sila and Dobni (2012) conducted an online survey of North American SMEs to identify the B2B e-commerce (B2BEC) usage patterns in their supply chains, in purpose to discover the contextual factors that influence usage patterns. Three distinct types of B2BEC usage patterns-E-Limiteds, E-Leaders and E-Laggards-were then emerged. Different sets of contextual factors contribute to the formation of

these three patterns of B2BEC adoption. Higher levels of B2BEC applications result in stronger firm performance. The buyer-supplier relational advantages from different types of e-marketplace affected both the operational and financial performances of a company. In terms of improving performances, the better buyer-supplier relationships greatly improved financial performance in the many-to-many e-marketplaces rather than in the many-to-one cases (Oh and Kim, 2011).

Schubert and Legner (2011) investigated the current status of electronic collaboration in global supply chains, as from a technical aspect. They adopted an in-depth case analysis to identify five integration scenarios. The reference model comprised technical, organizational and institutional levels to reflect the multiple facets of B2B integration.

Related research revealed that the behavior of organizational leaders would contribute to the behavior of subordinates in B2B-based SCM. Even sourcing leaders could influence buyer-supplier relationships directly to both sides when they act opportunistically and indirectly, as sourcing professionals take note of these leaders' actions. Through the B2B platform, buyers are inclined to behave more opportunistically when perceiving the associated benefits was exceeding the costs. The leaders' opportunistic behaviors also further strengthened buyers' tendency toward acting opportunistically under conditions of positive expected utility. (Hawkins *et al.*, 2012; Xue *et al.*, 2013; Li *et al.*, 2007; Quaddus and Hofmeyer, 2007).

Information sharing, collaboration, trust, integration and communication were chosen as factors of the buyer-supplier relational advantages in the e-marketplace. Those factors were then empirically analyzed as regards a company's operational and financial performance.

Four flows in SCM on B2B e-marketplace: There are four different flows, known as the logistic flow, fund flow, operation flow and information flow in SCM. The core in SCM is to coordinate and control these 4 flows, realizing the system's efficient operation and meet customer demands. During operation, the supply chain, logistic flow, fund flow and operation flow are all closely related to information flow, so the decision-making upon accurate information turns out to be the key to success operation of entire supply chain. The information flow is always packed with frequent movement, complex structure and fast change, normally regarded as the basis in trading, strategic analysis, planning, management and control etc., or in one term, to be the central factor that ensures the coordinated operation of supply chain. However, problems such as information delay, deformation and asymmetry often occurred to such an important flow and

decrease operation efficiency over the chain (Wang *et al.*, 2007). Those deteriorations are mostly initiated from issues including the optimization activities of members in the supply chain, changes of demands based on prediction, order in advance, mass orders, product order strategies of enterprises, price changes, shortage gaming, multilayer of supply chain and the members' failure in sharing demand information and much more (Green and Pearson, 2011).

As the wider application of B2B e-marketplace in supply chain of corporations, supply chain change from simple linear patterns to network that include relationship between the core enterprise and its suppliers, that among suppliers and that among customers. The corporations are now connected to logistic chain, information chain, fund chain and added-value chain of suppliers and customers. B2B e-marketplace provided new basis of technology for SCM and promoted innovation in SCM (Li, 2009).

Supply chain information exchange structure based on B2B platform:

In traditional supply chain, product or service information are spreaded as study document flowing between nodes over the chain. The information flow is basically synchronized with the logistic flow. Both informatic and physical structure of the supply chain are in layers and similar to each other, so the efficiency of flow is relatively low. The result is an information exchange structure based on multi-directional product (or service), with manufacturers surrounded by middleman, suppliers and distributors (Fig. 2). It is noteworthy that

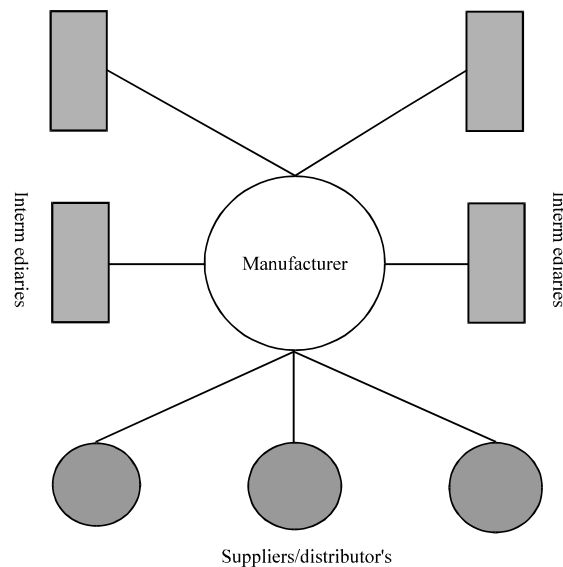


Fig. 2: Manufacturer's supply chain information exchange structure

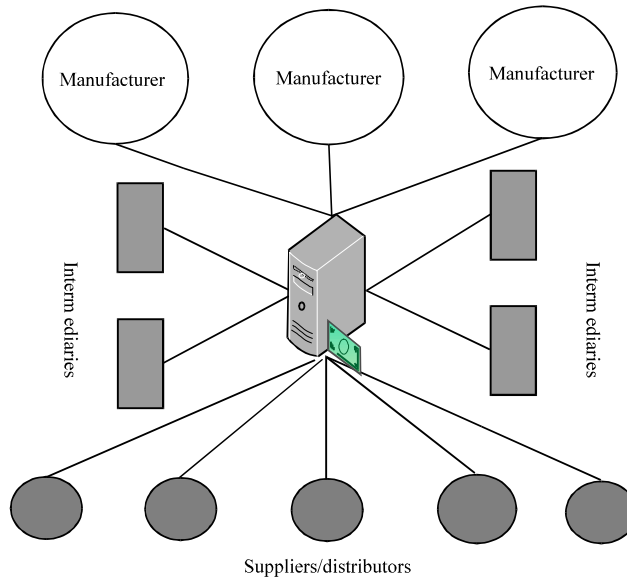


Fig. 3: Supply chain information exchange structure based on B2B platform

the manufacturer must be resourceful to construct a supply chain information exchange network with locating themselves in the center and further use it for value creation. It is obviously beyond the capability of a small or medium sized manufacturing enterprise. Therefore, this model is generally very specific to large enterprises and reflects their radiation power. However, the capability of a single enterprise, no matter how large it is already, is never fast enough to react with market changes, hindering the efficiency of the supply chain. There are some large manufacturing companies with high production cost, high asset specialty, high trading uncertainty, high trading frequency and high product complexity. These companies may also choose this model to reduce trading cost.

Nowadays, the widespread application of B2B e-marketplace has helped many manufacturing enterprises achieved the alternation of information exchange from traditional method to B2B e-marketplace exchange and from one-to-one to one-to-many and many-to-many. The refurbished information exchange has promoted information sharing of all the members in the supply chain (Luo *et al.*, 2010). All the nodes of the supply chain gain the direct connection in a B2B e-marketplace (Fig. 3).

Information server nodes started to unleashing their power in the chain system as IT application in supply chain became much more important. These nodes are usually B2B e-marketplace service providers that provide information exchange services to member enterprises in the supply chain. On a B2B e-marketplace, all the members including manufacturers have direct connection with all other nodes in the supply chain, at the same time being

one of the information agents for multiple supply chains. Considering the size effects and resource multiplicity, such web platform is usually unlimitedly connected with other members of the network. For example, China's leading e-commerce company Alibaba possesses dozen millions of online registered clients, the number is still increasing and it is working to optimize collection of supply chains (Zhang *et al.*, 2012).

The effective and organic integration of up-stream suppliers, manufacturers and down-stream distributors, customers is now feasible, for a corporation with the support of B2B e-marketplaces, to meet the demands of fast and efficient production and operation with all the useful market resources. The integration had now also became the key to realize dynamic control over the enterprises, as well as the integration and optimization of all the resources, efficiency enhancement, gaining market competitiveness and the realization of high efficiency and optimization of enterprise activities. From the angle of transaction cost, a B2B e-marketplace suppressed the transaction costs among members of the supply chain.

B2B E-MARKETPLACE CHANGES SCM OF MANUFACTURERS

Adding value to SCM of manufacturers: B2B e-marketplace adopts customer oriented and procedure oriented management to ensure the rapid reaction to market changes. It also pays special attention to procedure optimization, eliminates redundant and inefficiency works in enterprises. Resources are utilized in

full value in all the flowing processes to realize the lowest cost and the highest efficiency. As a result, B2B e-business model has brought great reform of enterprise value chain.

B2B e-marketplace model resolved many problems from traditional supply chains of manufacturers, as it is not limited within the enterprise. Instead, it extended itself to suppliers and customers, or even their own suppliers and customers. Such applied trans-enterprise cooperation now covers the entire process from product design, demand prediction, outsourcing, purchasing, manufacturing, distribution, storage, transportation and customer service. Although, the supply chain did not change much, the enterprises were no longer in zero-sum game but a win-win relationship. Such transition added value to the supply chain and the amount of added value on each node finally yield to the competitiveness of manufacturing enterprises (Croom and Johnston, 2003).

B2B e-marketplace model gave extra value to enterprise supply chain. It also connected the up-stream and down-stream enterprises to form a supply chain, or even a dynamic, virtual and global supply chain network. The inter communication and operation reduced purchasing cost and logistic cost of manufacturing enterprises. B2B e-marketplace was also a way to establish value chains among enterprises and even trans-industry value chains to realize reasonable added value in each procedure of the supply chain network. When manufacturers and retailers use B2B e-marketplace services to outsource logistic service and information management, there formed a new value chain between manufacturer, retailer, logistic service and information service providers (Shi and Yang, 2010).

B2B e-marketplace enhanced manufacturing enterprise competitiveness through expediting the response speed of enterprise to market and end user demands. Information in traditional SCM was transmitted by steps, thus inevitably causes low efficiency and high error probability. Seldom cooperation was found in the logistic system due to limited information sharing. All the members are in the basic supply and demand relationship, leaving high cost of inventory and transportation. With SCM based on B2B e-marketplace, the members can use internet to exchange information and plan about business cooperation without the external interruption from time and space. All nodes are now rapidly integrated with precise and efficient connections between units of information systems, to make the most extended use of resources. Connection and integration of information flow also promoted logistic integration to reduce logistic cost, transportation cost and risk cost and greatly increase the profits. Enterprises using supply chains based on B2B e-marketplace now react quickly to changes of external

markets and seize more opportunity. They are now pushing the supply chain towards an ideal, dynamic, flexible, virtual and flattened network, or in the form of enterprise unions or enterprise networks.

B2B e-marketplace simplifies the procedures and increases production efficiency. Purchasing, production and sale are the three main procedures in a supply chain. Now the introduction of B2B e-marketplace brought significant changes to all of them. In purchasing, necessary materials were conveniently and precisely ordered through B2B platform, with selection of suppliers in a bigger scope and effective management to suppliers. It obviously decreased the numbers of purchasing staffs and increased purchasing efficiency. In production, it removed unnecessary procedures and inventories, increased fund efficiency with fast acquisition of information about supply and sale. In sales, customer relationship management was effectively implemented with database resources, increase customer loyalty and customized marketing.

B2B e-marketplace is also transforming itself from simply information flow, to extra services with fund flow and logistic flow. Meanwhile, the logistic flow in online wholesale is now also the key point for development. In early days, trading partners were required to solve the problems of logistic flow by themselves. With online trading, providing logistic services to customers on B2B platforms is a necessary and common set as in response to their natural demands. Besides, it should also lead the progress of combining three flows (information flow, fund flow and logistic flow) in the consumer product wholesale market. In manufacturer SCM, B2B e-marketplace is applied to manage more than just information flow. Effective management of fund flow and logistic flow joined recently, bringing manufacturer SCM to a new level of development.

Alibaba: A case study: Launched in 1999, Alibaba.com International is the leading global e-commerce platform. As global leader in e-commerce, Alibaba already has a substantial safe and simple trade solutions with ties to over 2 million supplier storefronts.

With powerful suite of tools for finding reliable and capable suppliers, Alibaba can conduct supplier assessment:

- Assessment reports plus verified videos
- Details of supplier's production and trade capabilities
- Verified onsite by leading verification companies
- By using customized sourcing service in Alibaba B2B e-marketplace, buyer could receive up to 10 quotes after filling out a buying request
- Genuine, verified and complaint-free suppliers

- Prompt service with quotes in as little as 48 h
- Use 5 min and receive up to 10 quotes
- In Alibaba B2B e-marketplace, buyer could find reliable inspectors to ensure product quality via its inspection service
- Reliable inspectors
- Affordable service

With Alipay providing payment services in Alibaba B2B e-marketplace, buyer could add extra realms including the fund flow to its existing serving receivers.

CONCLUSION

B2B e-marketplace is the first step for many manufacturing enterprises upgrading themselves to e-business. Its application will be constantly developed and improved, for its constant and close connection to manufacturer SCM, as well as other integrations into the construction of many business systems. For example, a manufacturing enterprise needs to have close connection with their financial system, ERP system and CRM system. A well established integration of these systems could serve to realize information sharing and automatic business procedures. Massive investments in human resource, material resource and fund resource are undoubtedly needed for such a construction and become an inevitable obstacle for most small and medium manufacturing enterprises. The B2B e-marketplace, however, provides them another chance to realize goals step by step from low end to high end and from single breakthrough to overall development.

B2B e-marketplace empowered its user with steady access to high-quality technical and service protections with low cost, as well as secured but smooth implementations of enterprise e-business strategies. The combination of e-business and SCM brought major alternations to manufacturing enterprise management model and business procedures. Integrated SCM is the direction of development. Through integrated SCM, a manufacturing enterprise can realize integrated network cooperation and integrate every hinge on the supply chain into one single e-business platform, including purchasing, production, sale and finance, forming an integrated system with all the functions of SCM. Such an integrated SCM under the e-business environment is aimed to make all the nodes and functions realize good cooperation and coordination, to maximize profit of the whole supply chain. The key is to realize coordination, agility and flexibility of manufacturing enterprises in the supply chain, through every strategic and tactical level.

Summarizing for all, B2B e-marketplace brings every possible benefits to manufacturing enterprise to improve

its supply chain operation efficiency. SCM is the best choice for a manufacturing enterprise to expand B2B e-marketplace, comprehensively promote their e-business operations and reshape development strategies and operation models under the corresponding environment. Other necessities for an effective SCM may also include the improvement of internal cooperation, acceleration of both reactions and information flow speed.

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