The Role of Supply-Chain Management in E-commerce

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Abstract: E-commerce does not just mean trading and shopping on the Internet. It means business efficiency at all operation levels. Executives know it is critical to effective business operations, but until now quantifiable performance measures have been as scarce as the number of corporate executives of China who heard of the phrase “supply chain management” (SCM). Supply Chain Management means coordinating, scheduling and controlling procurement, production, inventories and deliveries of products and services to customers. The SCM is the backbone of E-commerce, a very critical component of E-commerce. Supply Chain Efficiency means having the right product at the right place at the right time, can save money/reduce costs, and can enhance cash utilization. A significant number of companies in the United States have implemented their Internet platform for Supply Chain Efficiency in the past 2 to 3 years, and the large of them will follow in the next few years. We will briefly review how the SCM can bring the benefits to the western corporations and Chinese corporations. Some case studies and B2B standard proposal will be presented to illustrate the benefits and bottleneck of E-commerce implementation in China.

INTRODUCTION

Competition in the 21st century will be across supply chains, not individual companies. A supply chain is a network of facilities and distribution options for the entire network of companies to work together to design, produce, deliver, and service products. Since its inception about 10 years ago, the field of supply chain management has become tremendously important to companies in an increasingly competitive global marketplace. Companies focused primarily on manufacturing cost (C) before 70’s, quality (Q) improvements in 70’s, product delivery time (T) in 80’s, services (S) in earlier 90’s, and environmental (E) compatibility in late 90’s within their bounded walls; now their efforts extend beyond those walls to encompass the entire supply chain efficiently and intelligently in a knowledge-based (K) economy of this Millennium [1-3].

People are a kind of forgetting what efficiency and tools mean for the past industrialization process. Tools or automation have played a significant role in production quality and efficiency. Modern transportation tools have advanced delivery efficiency in a tremendous way. Money as a financial instrument is an obvious tool to facilitate product exchange efficiency. How does Internet help to transform and shape today’s companies in this information era? The answer is “ebusiness”. E-business infrastructure is an information tool for optimizing the entire business management and operation processes. In his article, “Executive
Overview: Managing Real World B2B Integration”, Peter Linkin, a senior manager of product marketing of Vitria Corporation stated what is required in order to gain full benefit from ebusiness as follows:

- Integrated, automatic system-to-system interaction with all trading partners
- The ability to integrate those interactions seamlessly with your in-house applications and processes to provide true end-to-end visibility and control
- Accommodation of the individual nuances of each partner's mode of interaction
- A high-quality and reliable means of exchanging messages over the Internet, which provides business-level guarantees of delivery and integrity
- Intelligent management of those interactions, allowing control and ability to change them dynamically
- The ability to adapt to change, by quickly and easily locating new services or partners, learning their specific capabilities, and forming a rapid “electronic bond” with them

In a simple phrase, an integrated supply chain management (SCM) system is the backbone to achieve the above ebusiness objectives. Although the phrase “SCM” conjures up different meanings to different people but one fact is clear: businesses have been striving to achieve efficiency in their "sourcing," "making" and "delivering" for nearly 20 years, according to Bill Hakanson from the Supply-Chain Council organization. He also gave a couple of definitions of SCM as follows when he gave a brief descriptions of Supply-Chain Operations Reference-model proposed by the organization: “Supply Chain means all inter-linked resources and activities needed to create and deliver products and services to customers. In the truest sense, the supply-chain spans from the point where natural resources are removed from the earth to the point where they are replaced in the earth: "from dirt to dirt." Supply Chain Management means coordinating, scheduling and controlling procurement, production, inventories and deliveries of products and services to customers. Supply Chain Management includes all the steps you do everyday in your administration, operations, logistics, and information processing from your customers to suppliers.”

Supply Chain Efficiency can improve customer service - having the right product at the right place at the right time. Supply Chain Efficiency can save money/reduce costs. According to a recent benchmarking study conducted by Pittiglio Rabin Todd & McGrath, one of the founders of the Supply-Chain Council, best in class companies have an advantage in total supply chain management cost of 3 to 6 percent of revenue (Total supply chain management cost is the sum of Order Management, Material Acquisition, Inventory Carrying, and Supply-Chain Finance, Planning, and MIS Costs). Supply Chain Efficiency can enhance cash utilization. According to the same study cited earlier, supply chain efficiency have a 40 to 65 advantage in cash-to-cash cycle time over average companies. Leading companies have cash available 2 to 3 months faster. (Cash-to-cash cycle time is calculated as
inventory days of supply + days sales outstanding - average payment period for materials.)

In the coming April of 2001, Stanford University is going to hold its regular forum on Supply Chain Management, which has more than 150 companies represented in the past. The organizer is trying to attract the participants by starting to ask the following questions:

- Is your product design linked to supply chain considerations?
- Are your supplier and outsourcing strategies coordinated?
- Do you and your partners have performance measures in place to measure true supply chain effectiveness?
- Is your organizational structure inhibiting successful supply chain management?
- What will be the effect of the Internet on your supply chain?

The organizer concluded that with an integrated supply chain management system in place, you can answer these questions confidently; You can simultaneously improve customer service and reduce inventories across the chain; What's more, if you integrate supply chain concepts into your product development and design plans early on, you'll gain economic and competitive advantage throughout the entire product-life-cycle.

As Peter Linkin put it, the global rush toward ebusiness is having a profound impact on organizations in every industry. It affects not only how they do business with their customers, suppliers, distributors and other trading partners, but also how they must manage their businesses internally. What is more, the nature of ebusiness itself is rapidly evolving, further compounding the rate at which business transformation must occur.

A significant number of companies in the United States have implemented their Internet platform for Supply Chain Efficiency in the past 2 to 3 years, and the large of them will follow in the next few years. Now, how can companies in China use the cutting-edge information technology to realize the leap-forward development at the affordable price? In the following, I will show you our experience in facilitating China e-business process by illustrating several case studies.

**TECHNOLOGY & STANDARDS**

Business world is moving ever faster than before. Adaptation to change is very important for any e-business software. Agility will become a necessity for any e-business infrastructure software. HuiQing is proud of saying that our e-business solution software is a technology leader having a full set of agile implementations including HuiQing Agile Supply Management System [4]. HuiQing will be briefly introduced in the section of Case Studies.
The credit on payment over Internet and lawful accounting practices will be a serious problem to affect China E-Business development. It relates to legal aspects and law enforcement practices. It will be a very hard fight to overcome legal hurdles. Instead, we here focus on technical aspects for standardization of China e-business transaction. According to The Standard for Internet Commerce [5], Prof. Zhang proposed the Reference Standard for China B2B Enterprises as follows [6]:

A. Purpose

1. To increase enterprise satisfaction and confidence in doing business on the Internet.
2. To establish credibility and trustworthiness of enterprises, suppliers, and distributors.
3. To help enterprises provide a world-class customer experience, innovate rapidly and lower their costs.
4. To support and enhance self-regulation of B2B Internet commerce.

On one hand, enterprises can declare their B2B practices are compliant to this standard; on the other hand, enterprises can examine if other suppliers and partners are providing high quality services according to this standard. This reference standard is divided into 7 sections with total items of 42. Each item was assigned either as a “Minimum Acceptable Standard” or as a “Best Practice”. Any enterprises that declare their B2B practices obey this standard shall meet the minimum acceptable standard.

B. Recommendations and Requirements:

1. A Ubiquitous Information Center

1.1 B2B Enterprises shall create an Information Center and provide a link to it from every page of their site. (Minimum acceptable standard)
1.2 The B2B enterprise shall use the word “information” in naming the enterprise’s Information Center. (Minimum acceptable standard)
1.3 The Information Center shall acquire a digital certificate from an authorized CA center. (Minimum acceptable standard)

2. Disclosures

2.1 The enterprise shall provide customers with the following information about the enterprise in the enterprise’s Information Center: Legal name and ownership, Physical address of a primary office, How to contact the enterprise. (Minimum acceptable standard)
2.2 Before the customer is required to confirm a final binding order, the enterprise shall provide the customer with access to a clear statement of ALL charges that will be included in the customer’s bill including product/service cost, shipping and handling charges and taxes. (Minimum acceptable standard)
For each item offered for sale, the enterprise shall in its Information Center provide the customer with complete warranty information. This shall include: the length of the warranty, what aspects of the item's construction or performance are covered, what aspects of the item's construction or performance are not covered, who will honor and administer the warranty, and how warranty remedies are activated. (*Minimum acceptable standard*)

For each product/service offered for sale, the enterprise shall provide in its Information Center information about what, if any, post-sale support or service is available. This shall include: a description of the support or categories of support that is provided or offered, including how the customer can get support, the length of the product support period, who provides the support, and the cost of the product support. (*Minimum acceptable standard*)

In the enterprise’s Information Center, the enterprise shall notify the customer which country’s laws that the enterprise believes apply to the customer’s transaction. (*Minimum acceptable standard*)

In the enterprise’s Information Center, the enterprise shall describe the customer’s payment alternatives. (*Minimum acceptable standard*)

Enterprises shall provide customers with access to the enterprise’s cancellation/return and refund policy in the enterprise’s Information Center. This policy shall include: The period in which the order can be cancelled and/or product can be returned; any conditions associated with the enterprise’s acceptance of a return; order cancellation and/or restocking fees; who pays for return shipping; when the enterprise will refund the customer’s money. (*Minimum acceptable standard*)

The enterprise shall notify customers of any restrictions (for example, restrictions based on location or quantity) regarding who or where the enterprise will sell or ship to in the enterprise’s Information. (*Minimum acceptable standard*)

Before the customer is required to submit a binding order, the enterprise shall provide estimated availability from inventory of each item offered for sale (defined as estimated time to product shipment or order execution). (*Minimum acceptable standard*)

Items that are promoted on a Website but that cannot be ordered directly at the site shall be identified with a consistent page treatment, logo, color scheme, or other distinctive treatment that will inform the customer. (*Minimum acceptable standard*)

Any customer placing an order for an item that is not in stock at the time of the order should be notified by the enterprise when the item becomes available. (*Best practice*)

The enterprise shall provide at least the following information on their privacy policies (*Minimum acceptable standard*):
• What customer information is gathered by the enterprise and where it is gathered.
• The purposes the enterprise uses the customer data for.
• Whether the enterprise provides customer data to third parties and under what circumstances.
• Whether the receipt of customer data is an integrated part of the enterprise’s business model such as in the case of a targeted marketing service, a targeted partnership, etc.

4.2 Enterprises shall provide the customer with the ability to choose that the customer’s personal information will not be used by the enterprise to send the customer unsolicited materials and the choice will be provided at least at the time the customer’s data is initially gathered. (Minimum acceptable standard)

4.3 In the enterprise’s Information Center and Privacy Policy description, the enterprise shall provide links to the privacy and security policies of their relevant third parties when those third parties have privacy and security policies that are different from the enterprise’s. (Minimum acceptable standard)

4.4 Enterprises shall provide encryption of the transmission of the entire purchasing session and all data provided by the customer. (Minimum acceptable standard)

4.5 Enterprises shall provide encryption of personal information about the customer that the enterprise has stored. (Minimum acceptable standard)

4.6 In the enterprise’s Information Center, the enterprise shall provide customers with information regarding its security practices including what interactions and data the enterprise secures. (Minimum acceptable standard)

5. Confirmations and Notifications

5.1 An enterprise shall provide confirmation via e-mail that the enterprise has received the customer’s order within of one business day of the customer’s placement of the order. (Minimum acceptable standard). The enterprise shall include the Total charges information in their Order Confirmation or provide clear information on how to get this information (Minimum acceptable standard)

5.2 Enterprises should notify the customer via e-mail that the customer’s order has been shipped or executed within one business day of the shipment or execution. (Best practice)

5.3 The enterprise shall include the following information in their notification of order shipment or execution or provide clear information on how to get this information (e.g., the enterprise may provide a link to a place where the customer can find the expected shipping date) (Minimum acceptable standard):
• Items ordered,
• Total charges,
• Where the order is being shipped and how the order is being shipped,
• Expected shipping date and
• What to do if there are questions/problems
5.4 The enterprise should provide tracking information to enable the customer to track the status of the customer’s shipment if the customer has chosen a shipper that provides tracking information. *(Best practice)*

5.5 The enterprise should notify the purchasing customer that the customer’s shipment was received and who received it, if the customer has chosen a shipper that provides such information. *(Best practice)*

5.6 In cases where the enterprise ships a partial order, the enterprise should notify the customer via e-mail that the remainder of the order will be shipped separately at a later date. *(Best practice)*

5.7 If a customer has cancelled an order or returned an item, the enterprise shall notify the customer that the enterprise has received the order cancellation or the returned merchandise within three business days. *(Minimum acceptable standard)*

6. Help and Customer Support

6.1 The enterprise shall provide customers with mechanism for submitting a question or complaint via e-mail. *(Minimum acceptable standard)*

6.2 The enterprise shall provide access to the enterprise’s customer service policy in its Information Center. *(Minimum acceptable standard)*

6.3 The enterprise shall provide a means for customers to provide feedback or file complaints. *(Minimum acceptable standard)*

6.4 The enterprise shall acknowledge receipt of a question or complaint within 48 hours of receiving it. *(Minimum acceptable standard)*

6.5 If the complaint is regarding merchandise and cannot be handled by the enterprise, the enterprise shall provide the customer with an appropriate contact at the manufacturer. *(Minimum acceptable standard)*

7. Additional Enterprise Practices

7.1 Enterprises shall ensure that every package shipped receives the shipper’s standard insurance that guarantees against loss, theft, and damage. *(Minimum acceptable standard)*

7.2 Enterprise shall provide the customer with all relevant order data in a format that can be printed as a receipt. *(Minimum acceptable standard)*

7.3 If the shipper chosen by the customer supports it, the enterprise should provide customers the ability to provide special delivery instructions to the shipping company. *(Best practice)*

7.4 The enterprise should offer a “one-click ordering” capability, giving customers an option to buy a product with only one click (this assumes a customer has previously provided required data). *(Best practice)*

7.5 The enterprise should support ECML (Electronic Commerce Modeling Language) to allow consumers to fill out shopping cart forms without typing in repetitive information such as shipping and billing information. *(Best practice)*

7.6 The enterprise should process orders and authorize the customer’s transaction in real-time. *(Best practice)*
7.7 Enterprise should offer a site-wide search function to allow keyword searches for information and/or products. (Best practice)
7.8 The enterprise should provide the customer with a means to check on the status of an order via a Web-based report. (Best practice)
7.9 The enterprise should provide the customer with access to the customer’s order history. (Best practice)

CASE STUDIES

HuiQing software firm is trying to help enterprises to comply with the above reference standard whenever we are asked to provide ebusiness solutions. Shanghai HuiQing Information Technology Limited was registered at Shanghai Pudong Software Park, which was incorporated by the CIT lab of Shanghai Jiaotong University and two professors who received the Ph.D. degrees from Stanford University. HuiQing has a strategic partnership with HiQTech, Inc. at San Francisco. HuiQing provides an integrated total solution of ebusiness. The mission of the company, via its own proprietary software products and consulting services, is to update information systems for China enterprises, to facilitate the potential capabilities of China enterprises in the area of new product development and operational and strategic business management, therefore, to speed seamlessly their advancement to world-class level. HuiQing Total E-Business Solution Set includes six modules as follows:

1. HiQ-SCM: This is a rapid re-configurable and re-constructed agile supply management system, which can support an integration of different ERP, different MIS systems, and workflow management.

2. HiQ-INS: This is an integrated network security system. It includes a Digital Certificate System with our proprietary CSP module, a Secured E-mail system, and a Secured Firewall supporting VPN tunnel and a secured data management system to ensure the integrity and tracibility of all kinds of important data, documents, and transactions of both intra- and inter-enterprises.

3. HiQ-WFM: This is an intra/inter enterprises workflow management system. It provides a modeling and management platform for rapid deployment of business process reengineering and product development process reengineering. It provides a versatile process control and management capabilities, including a unified workbench for daily coordination and communication among team members, while each activity can be tightly connected with and bounded by enterprises’ ISO 9001 regulations.

4. HiQ-CBD: It is a case based knowledge management system (KMS) for DFX applications and other decision-making applications. To meet the requirements of dynamically changing and expanding KMS, HiQ-CBD allows user to define and modify case attributes dynamically whereas the back-end database and front-end GUI could be self-adjusted by the system. Users could simply define and modify domain ontology and inference rules to control the behavior of those intelligent agents.

5. HiQ-CRM: This is a Customer Relationship Management System. It is based
on a combination of CTI and web platform for operation management for customer responses and a business intelligence system for studying customer behavior.

6. HiQ-IDM: This a financial portfolios management and forecast system for the various markets in China financial industry with the intelligence support engine with an integration of modern statistical signal processing, fuzzy neural network, and genetic algorithms.

The Company’s customers include Jincheng Group, Sundiro Group, Shanghai Volkswagen Manufacturer, and Only Bookstore, and National CIMSNET.

Case 1: Only Bookstore

With help of HuiQing Ebusiness solutions software HiQ-SCM, Only bookstore has greatly widen her sales channel. Her customers span from Shanghai only to over 30 cities in China and oversea as well. The sales revenue has increased by 20%, and the sales cost has reduced 10%. In the mean time, inventory has reduced 30%, and stock-in period has reduced to 1~2 days from 7~15 days.

Case 2: Jincheng Group

With help of HuiQing Ebusiness solutions software HiQ-SCM, Jincheng Group can manage her order and communication with her suppliers and distributors within one day. The waiting time for parts has been reduced 10% per month, which contributes to total revenue 6 million RMB annually. The total inventory level has been reduced 20~30%. The finished product stock period has been reduced 10~15% while the stock period of parts and products-in-process has been reduced about 10%. It at least saved storage cost 20 million RMB in procurement.

Case 3: Sundrio Group

With help of HuiQing E-business solutions software HiQ-WFM and HiQ-CBD, Sundrio Group has increased the interchanging capabilities of her motorcycles parts by 50%, which has saved at least 6 million RMB costs. The product series development process has been shortened by 50%, which is about from 8 months to 3 months. The Group also accomplished a new product development with a reduction of design errors by 70%, which reduced approximately 7 million RMB losses. The whole new product development cycle has been shortened from 15 months to 9 months, which brought a profit of 18 millions RMB out of the added sales revenue of 120 millions RMB within a year.

DISCUSSIONS

According to PMG’s 1999-2000 Supply-Chain Management Benchmarking Series, 1995/96-1998 best-in-class cross-industry-composite performance improvement is 27% in total supply-chain management cost, 18% in Cash-to-Cash cycle time, 65% in upside product flexibility, and 1% in delivery performance to
request. It would be very hard to compare the benefits between companies of China and USA without knowing the accounting differences. However, China enterprises will have far better management improvement than the western companies since China enterprises’ management is at relatively lower ground.

The implementation of a supply chain management system in your company isn’t a trivial thing. It is related to your management style, your business strategy, your IT system and many others. Of course, there is a suggested (and practically validated) way to implement supply chain management system. In fact, there are many ways you can benefit from the concept and implementation of supply chain management. Setting up a supply chain management system for your company is like to put an electronic door to your company. You can communicate with outside world via the electronic door while keep your preferred management strategy inside.

Most important characteristic of a supply chain management system is its agility to any new cooperation structure. Global economy makes the heterogeneous complexity of a virtual organization become unpredictable. Although we have made some efforts on this aspect, there is still a long way to go to achieve the goal that we would be able to integrate with any EPR or other SCM systems in a few days, neither other companies in the world can do it at this moment. Yes indeed, your investment on the HiQ-SCM is protected since the software is adaptable to your business process re-engineering.

REFERENCES