

Association for Information Systems

AIS Electronic Library (AISeL)

ICEB 2009 Proceedings

International Conference on Electronic Business
(ICEB)

Winter 12-4-2009

Strategy Formation Framework for Technology Adoption in Supply Chain Management

Benjamin Yen

Follow this and additional works at: <https://aisel.aisnet.org/iceb2009>

This material is brought to you by the International Conference on Electronic Business (ICEB) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ICEB 2009 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

STRATEGY FORMATION FRAMEWORK FOR TECHNOLOGY ADOPTION IN SUPPLY CHAIN MANAGEMENT

Benjamin Yen

School of Business, The University of Hong Kong, Hong Kong

benyen@business.hku.hk

Abstract

Firms have been seeking the strategies for technologies adoption to improve the internal performance and to streamline the processes with both partners. Emerging IT and manufacturing technology are the main driving forces. To form competitive strategies, the companies need to know the current situation, the projected position, and the technology to adopt to achieve the goal. A framework of strategy position map is presented to locate, set and move company's strategy position based on IT adoption and corporate focus. Case studies on the firms from different parts in the supply chain for various industrial sectors demonstrate the applications of the proposed framework. The paper provides a discussion on the issues of observations, guidelines, components selection, and implications. The paper concludes strategy position map can help companies to form the strategy for supply chain management, and highlights the challenging coordination for intra-firm and inter-firm strategy formation.

Introduction

Globalization has come to the new era on the reformation in business. Companies have been seeking the strategies to improve the operation efficiency and collaboration with supply chain partners. In order to form a competitive strategy, the company should take into account technology adoption and deployment in long term basis. The company not only needs to identify its current situation (or position) but also need to decide the expected situation (or position). In addition, the companies have to decide how to move to the expected position by adopting technology, systems, or initiatives.

A framework of strategy position map is presented to locate, set and migrate company's strategy position based on IT adoption and corporate focus. Case studies on the firms from different parts in the supply chain for various industrial sectors demonstrate the applications of the proposed framework. The paper provides a discussion on observations that companies need to take into account both temporal and scope aspects in adoption of technology, systems or strategies. The cases studies further highlight some guideline about balanced, economic, progressive, dynamic, and

streamlined issues. Several contemporary commercial systems, such as ERP and RFID, are discussed as the exemplary technology for strategy formation to illustrate the importance of both based-on and paired-with components in IT adoption. The paper also gives an explanation that IT adoption has become the pressing issue for the transformation in logistics industry because of both direct and indirect driving forces. The paper concludes strategy position map can help companies to form the strategy for supply chain management and highlights the challenging coordination for intra-firm and inter-firm strategy formation.

The Section 2 focuses on the framework of strategy formation for technology adoption. The strategy formation map is used to denote the company current status and expected position of the technology capability. The measures of technology capability is based on both information technology and manufacturing technology. Various case studies based on industrial classification are conducted. Section 4 discusses the implication of the study. The paper concludes the summary and future directions.

Preliminary Framework

Firms have been seeking the strategies for supply chain management by taking initiatives, adopting technology, and forming alliances. In order to form a competitive strategy, the company needs to know the current position, the projected target, and the technology to adopt to achieve the goal. A framework of strategy position map is presented to locate, set and move company's strategy position based on the adoption for both information technology and product technology.

Strategy map

The strategic move of company mainly can be classified into three stages – internal stage, external stage, and integrated stage. The internal stage mainly focuses on the company internal coordination on the operations; the external stage then concentrates on the synchronization with the immediate upstream and downstream partners; and the integrated stages brings together the various parties on the same chain to consolidate the activities and processes.

The improvement for supply chain management can be made in two aspects – information aspect and product aspect. The

information aspect includes informative, interactive, and integrated stages. The informative stages is about the intra-company information availability; the interactive stage focuses on the inter-company information exchange; and the integrated stage is mainly concerned the coordination of information processing on the chains. On the other hand, the *product* aspect includes product, process, and personalization stages. The product stage is about the product related issues (e.g., design and storage); the process stage is to streamline the processes to ship, distribute, or forward the product; the personalization stage is concerned the adaptiveness, responsiveness and customization. The product stage mainly focuses inventory management and personalization stage is more into the service management.

The information aspect and the product aspect denote the status of a company in the supply chain as shown in Figure 1. The information technology is the drive to improve the information aspects as moving upward. Similarly, the production and logistics technology function as the drive to improve the product aspect as moving rightward.

To evaluate and improve the supply chain performance, we can locate the current status of the company, decide the desired status, and select the appropriate approaches or technology to move there. In summary, there are three main issues in this framework – how to locate the current company position, decide the desired position, and form the strategy to move to the target position.

Firm position in SCM

The types of supply chain can be classified as follows [1].

- (1) *Traditional Supply Chain Relationship*. A traditional supply chain is asset-based, relatively customer insensitive and slow in adapting to new business conditions. Some firms focus on upstream activities (e.g. sourcing, manufacturing and inbound logistics) and others manage downstream activities (e.g. outbound logistics, branding and sales). The sequential activities force each party to focus on its own business. The interactions with partners are based on minimal exchange of information and decision-making is based on past information. It results in reactive solutions to market conditions since their business processes operate in silos, making it difficult to achieve supply chain efficiency.
- (2) *Building Efficient Supply Chains*. In addition to optimizing the internal business functions to deliver products and services in a timely and efficient manner, firms take the initiative to exchange product and logistics information through information technology. Streamlining of individual supply chain processes leads to

efficiencies but the gains were internal and the supply chain still did not maximize the efficiency throughout the chain of activities.

- (3) *Collaborative Supply Chain Integration*. Firms design their supply chain to manage one collaborative process rather than multiple processes and this integration is important to ensure uniformity amongst the partners in their supply chain network. Information is the key factor which could ensure such uniformity at all levels but it needs to be accessible to all key parties.

While the partners has established all the essential relationship levers (e.g. trust, long-term business partnership and mutual dependency), the final implementation would need to involve deeper organizational collaboration on both ends. In addition, the supply-chain focus needs to shift from developing mutual cost savings to developing a value chain of allies working toward the same strategic objectives. The benefits are not necessarily focused on functional efficiency but on factors (e.g. entire supply chain reliability and performance) which would have a strategic impact such as the flexibility of partners to respond to market changes with minimal disruption, the ability to penetrate new markets or speedy new product introductions. The partners would want to achieve maximum supply chain efficiency by developing an agile supply chain, which in turn would lead to shorter lead times. The main driver for this would be the transparent flow of information: by substituting information for the product, the need for inventory is eliminated as the chain becomes demand-driven rather than forecast driven. Figure 2 shows the types of supply chains.

Strategy types and strategy formation

There are several issues for the firm to consider the strategy formation:

- What is the firm's original position on the strategy map?
- What is the firm's desired or expected position on the strategy map?
- How does the firm move to the desired position?
- What about the upstream, downstream or other partners in the supply chain?

There are two levels of strategies that the firms should consider: macro level and micro level. The *macro level* strategy is from the supply chain perspective and *micro level* strategy is from the the individual firm perspective. In the Figure 2, in general, the firm's supply chain can be one of the supply chain types discussed above. The move of supply chain can be very straightforward and eventually most supply chains ideally evolve to collaborative supply chain. There are three possible

moving paths as shown in the Figure 2. The path selection is dependent on industrial characteristics and firm conditions. The first path is IT oriented approach that firms firstly focus on IT adoption to streamline the information flow to improve the internal operational efficiency, then gradually to coordinate and consolidate the business processes. On the other hand, the third path is to prioritize the changes on collaboration and service-centered issues before adopting IT to gradually improve the cooperation. The second path is a balanced approach to take into accounts both information flow and product flow.

Similarly, each firm may also take steps to enhance its strategic position in the supply chain. The firm could focus on IT adoption to enhance the information processing, exchange, and consolidation to move up in the Figure 2. On the other hand, the firm might focus on the synchronization and coordination of product flow to move right in the Figure 2. Of course, the firm might also take into account both concurrently.

In summary, the strategy of supply chain management can be viewed from two aspects – *level* and *orientation*. The level aspect includes macro (chain) view or micro (firm) view; the orientation aspect includes technology direction and operation direction. There are many initiatives, technology, strategies that have been applied to supply chain management in the last two decades as shown in Figure. For example, third-party logistics (3PL) has played the role to enable the management of product flow and Radio-frequency identification (RFID) tags are expected to enhance streamline and consolidation of information flow..

Case study

The study covers more than two hundred companies in various industry sectors both in Hong Kong, China, and overseas. The summary of selected case studies is listed in Table 1. The exemplary case study of HMV (Figure 3) is to illustrate the technology adoption and process coordination to enhance the strategic position in supply chain

Company and business background

HMV defines itself as a specialist retailer of music and movies. It targets the market's more serious buyers and collectors of CDs and DVDs by providing a broad range of items for selection. Some 60% of HMV's sales come from back-catalog and the remainder from best-selling items. Although the market for CD sales has stagnated, DVD sales have picked up because of the fast penetration of affordable DVD players. Capitalizing on its brand image and store management expertise, HMV's sales have been growing at the expense weaker competitors. It continues to expand its store network,

as the brick-and-mortar model still generates attractive returns in many markets, such as smaller towns in the U.K.

Although sales of CDs through large supermarket chains and online stores have emerged as new forms of competition, downloading of music via the Internet is HMV's greatest long-term threat. Many online downloading sites (e.g. Apple's iTunes) are entering the market. Unlike HMV, these new players have no existing market to protect. Longer term, even movie could be downloaded from the Internet after bandwidth limitation is resolved. Although the threat of the Internet is at an early stage, the pace of uptake is difficult to estimate. Given healthy operating performance of its current business model, HMV appears to have ample time and financial resources to chart its future digital strategy. HMV should prepare itself to meet the Internet challenge and grasp emerging opportunities by leveraging its retail presence, huge customer base and a strong brand in music.

Original position of HMV

On the *information* dimension, HMV is located on the interactive stage. HMV places great emphasis on managing its CD/DVD inventory and promoting items of both best-selling and backlist stock. To this end, it maintains close communication with disk distributors as well as the record labels. On the *product* dimension, HMV is most appropriately placed on the intersection of the product and process stages. The company is most concerned about selecting its store locations, store design, employee training, items and quantities to carry. The primary customer value proposition is a broad selection of titles, a comfortable setting, helpful and knowledgeable employees who can make good recommendations. These are mostly product-related issues and are the most critical factors driving success. As for supply-chain process, HMV focuses on streamlining distribution and logistics, aiming at reducing lead time and reducing inventory. In addition, managing reverse logistics is important in the dynamic marketplace. HMV has set up five online stores in the U.K., Canada (joint venture with Amazon.com), Japan and Australia. This alternative mode of distribution, by taking advantage of the company's physical facilities and brand value, involves many process-related issues such as fulfillment and online payment.

Projected position of HMV

The projection is based on the assumption that digital downloading of music and movie will become the norm in the future. As HMV invests in this emerging business model and its related technologies, it will be moving along the *product* dimension towards the integrated-personalization space. On the *information*

dimension, HMV will need to integrate with the information systems of the record labels and movie studios, which hold the rights to digital content. The online downloading model is likely to result in the disintermediation of distributors, since there is no need for production and distribution of disks. On the product dimension, the virtual business model excels over the physical model by giving customers great flexibility and convenience to buy digital content. For example, customers are no longer forced to buy a complete album, which may contain titles they do not like. They can choose to download song titles from a wide variety of artists, mix and play them in whatever order they desire. In short, Internet distribution of music and movies is a perfect example of personalization, empowering customers and ensuring no stock-outs.

How can HMV move there?

The first and foremost strategic requirement is to develop strong *relationships* and *mutual trust* with the major record labels and movie studios. To become a popular downloading site and consistent with HMV's traditional image, it should continue to carry a broad selection of titles. HMV needs to demonstrate to the copyright holders that it is a trustworthy partner and has the required technologies for distributing and protecting digital content. Obviously, HMV still lacks many of the capabilities. Some of the key technologies HMV will need to migrate towards an integrated / personalization supply-chain model for digital content are listed below.

- Development of an online storefront for customers to download music and movies. The website should be user-friendly, informative, secure, CRM-enabled and come with payment functionalities. It should make it easy for customers to locate and identify music by genre, artist, album, title, version and record company. It should also build in personalization features and offer suggestions to customers based on indicated preferences and historical browsing and buying patterns.
- Development of server technologies jointly with the major record companies and movie studios. The servers should be able to deliver different formats (e.g. MP3, WMA, WAV, HDCD, DSD for music, and MPEG4 for movies) to customers.
- HMV can consider entering into strategic alliances with hardware makers (e.g. Creative) and technology companies to develop improved devices and formats for downloading music and movie. Of course, the new devices and formats have to offer superior features and value over current devices (e.g. iPod and its proprietary AAC format). Another area of emerging

opportunity in the video space is portable-display device that features massive storage for movies in a highly compressed format (e.g. MPEG4).

- Development of technologies to prevent or limit the copying of downloaded content to disks or other storage media. Working jointly with the record companies, a flexible pricing scheme should be devised for different kinds of copying rights. For example, pricing could vary from free-of-charge for streamlining for pre-purchase listening, to a moderate rate for lower-quality formats, to higher rates for better-quality formats. Higher rates could be charged to allow for a limited number of duplicated copies.

Discussion

The discussion is mainly based on the case study above and other selected industrial examples summarized in Table 1.

Observation – temporal / spatial aspects

From the case study and summary of the cases, it is shown there are two aspects of observation on the strategy adoption - *spatial* aspect to reflect the importance of upstream and downstream partnership in strategic adoption, and *temporal* aspect describes the impact of time factor on the process of strategy formation. The strategy formation and adoption usually is not only based on company needs but also on the situation or requirements from the business partners, especially immediate upstream and downstream partners. Many companies outsource IT adoption or logistics operations to the correspondent service (i.e. IT and logistics) providers that enable adoption and coordination in the scope of both intra-organization and inter-organization.

The strategy formation and adoption is also an *evolutionary* process. Normally the strategy formation is a continuous process. Companies need to take into account the time issues in the strategy formation and revisit/revise the strategy on regular or ad hoc basis. In addition, the definition of stages of IT adoption and industry focus might evolve with time, so the strategy map is dynamic rather than static.

Suggestion - SCM implication / guideline

The general findings are described as follows.

- *Balanced*. The companies should keep and move toward the balanced position between the information dimension and production dimension.
- *Economic*. It would be cost-effective for the companies move along the diagonal line than the X-axis or Y-axis.
- *Progressive*. The strategic move should be progressed one stage by step on the strategic

positioning map.

- *Dynamic.* The company should keep on revisiting and revising the strategic move to adapt to the changes in the dynamic environment.
- *Streamlined.* The strategic move should be aligned with that for partners, especially immediate upstream and downstream partners as shown in Figure 4.

We discuss the supply chain types (i.e. traditional, efficient, and collaborative supply chains) and strategy types of moving paths. Taking into account the guidelines above, we can further conclude that the adjustment of focus scope needs to comply with the evolution of supply chain strategy. The firms start with the traditional supply chain by only focusing on internal linkage and integration. At this stage, the companies independently adopt and implement the strategy, for example, database installation and development of inventory control mechanism. Later, the firms convert to efficient supply chain by further enhancing the IT capability for interacting with other players and calibrating the business concentration on streamlining process and cooperation. At this stage, the companies need to work with their immediate upstream and downstream neighbors to decide the suitable strategy. Sometimes, they also get the help from the service providers to augment the linkages with their business partners. Finally the companies transform to a collaborative supply chain by moving to a more competitive position. The focus at this stage is to further deepen the relationships with partners for service oriented solution and joint decision. The collaboration scope evolves from firm to the whole chain as shown in Figure 5.

Selection - technology component

We have witnessed many technologies, systems, and strategies emerge along with initiatives proposed for supply chain management in the last two decades (please refer to Figure 6). For example, database management systems have been used to convert the enterprise data to digital and organized format. The concept of mass customization is proposed to manage the product variety and service-oriented solution.

The adoption of these system, technologies, or strategies can be seen as managing projects. To effectively improve project management efficiency to lessen the failure rate, it is crucial for the management to judge what, when and how to structure and allocate resources to the relevant projects. Weill and Broadbent [2] develop an IT Portfolio Management Model to help match IT investments to strategic objectives. The model identifies four broad classifications of IT investment: *Transactional*, *Informational*, *Strategic* and

Infrastructure. By realizing the four broad classifications, it can assist management to identify the project type, resources required, projected returns and potential risk level. The examples in Figure 6 can be further elaborated to denote the applicability scope and dependency relationships. To adopt and implement the system, technologies, or strategies in the Figure 6 would not guarantee the success for company's transformation. The firms should also take into account two critical issues - based-on components and paired-with components. The *based-on components* ensure the readiness for adoption. For example, some IT components serve as infrastructure to other IT systems. The *paired-with components* complement to the components to be adopted for mutual support and full benefits

We use two examples to summarize the discussion in this subsection. The examples are two extremes from two aspects – high or low level and macro or micro view. ERP system focuses on high-level adoption (integration) and micro-view (intra-organization) whereas RFID focuses on low-level (standardization) and macro-view (inter-organization). The ERP adoption normally assumes the readiness of IT infrastructure; otherwise, the adopting companies may suffer either the dramatic changes or under-usage result. The RFID adoption should be used with other system, such as middleware, databases, logistics systems, or ERP in order to get the full benefits.

Implication - service provider position

Logistics development is one of the indicators for industry advance and economy growth. In the last few decades, many large corporations have been moving part of the supply chains, especially manufacturing, offshore to take advantage of the cheap resources and low wage resources. China became the world-manufacturing powerhouse. In addition, the WTO, opening up the gate to China, has further sped up the process of logistics development to keep up with continuing and sustainable growth. A study about logistics development was conducted and examined through the latest transportation infrastructure and the cargo handling throughput with different means of transportation, railway, trucking, river shipping, ocean shipping, airway and multi-model transportation provided in greater China. Three case studies on logistics service provider for Proctor & Gamble (P&G) in China, Hong Kong and Taiwan respectively summarize the evolution of technology adoption, alliance strategy, and service packaging for logistics service providers in greater China [3-5].

IT brings the competitiveness and is treated as a kind of valuable logistics resources. The sole and joint use of IT brings many benefits to the companies and makes them more competitive in the

strategic planning. The logistics information system can be categorized as logistics operating system (e.g. transactional application for sales, warehouse, transportation) and logistics planning system (e.g. co-ordinate applications for forecasting, planning, management) [6].

Three major driving forces in third party logistics (3PL) transformation are supply chain trend, development of logistics infrastructure, and advancement of information technology (IT) –

- *Supply Chain Trend.* The trend includes internal integration, external coordination with upstream and downstream parties, partnership with other supply chain parties or service (e.g. logistics, IT, and financial) providers, outsourcing non-core business, etc. The progression pattern and pace varies in different industries. The requirement of agility, adaptability, and alignment [7] for contemporary supply chain practice highlights the great demand and high expectation for logistics support.
- *Development of Logistics Infrastructure.* The transportation and logistics has been changed in the last two decades due to the technology improvement (e.g. faster vehicle) and infrastructure expansion. On the one hand, logistics service providers would facilitate the new infrastructure development to provide broader and better services; on the other hand, high cost, high expectation from the clients, and high competition from the peers further accelerate the movement.
- *Advancement of Information Technology.* The adoption of off-the-shelf IT is pervasive in all business sectors. One trend is to integrate the subsystem (e.g. ERP) to enhance intra-organizational synchronization and inter-organizational coordination. Another trend is to utilize the wireless support and standardize the components (e.g. RFID) to convert the IT system from physical form with constraints to virtual platform for further consolidation. IT not only enhances the organization competitiveness but also improve the services to the clients. IT also plays as the service and communication infrastructure between suppliers and clients.

There are several commonalities and discrepancies among these three case studies [3-5]. Some noteworthy issues clearly point out that though they may differ in geographical location and length of history, they all evolve from the shipping-oriented operation to logistics service companies. In addition, coincidentally, they all have invested heavily on IT adoption in the last few years. On the one hand, IT

adoption help the transformation for logistics companies through streamline of information and operation, enhancement customer satisfaction, and differentiation in strategic move. On the other hand, IT adoption is also necessity for logistics companies to serve or even enable the client companies to move to a more competitive position as shown in the Figure 1. Through both direct and indirect driving forces, logistics industry needs to double the efforts on IT adoption and deployment in the transformation.

Conclusions

In the last two decades, firms have been seeking the strategies for technology adoption to improve internal operational performance and streamline processes with partners. IT and manufacturing technology are the main driving forces. In order to form a competitive strategy, the companies need to know the current position, the desired position, and the technology to adopt to achieve the goal. The paper proposes a framework of strategy position map to identify and to plan the strategic position in the context of supply chain. The information dimension includes informative, interactive, and integrated stages; the company focus includes product, process, and personalization stages. Case studies on the firms in different parts of supply chain for various industrial sectors demonstrate the applications of the proposed framework.

The paper provides a discussion on observations that companies need to take into account both temporal and scope aspects in the adoption of technology, systems or strategies. The cases studies further highlight some guideline about balanced, economic, progressive, dynamic, and streamlined issues. Several contemporary commercial systems, such as ERP and RFID, are also discussed as the exemplary technology for strategy formation to illustrate the importance of both based-on and paired-with components in IT adoption. The paper also gives an explanation that IT adoption becomes the pressing issue for the transformation of logistics industry due to both direct and indirect driving forces. The paper concludes strategy position map can help companies to form the strategy for supply chain management, and highlights the challenging coordination for intra-firm and inter-firm strategy formation.

The future research can be in several possible directions as follows.

- *Investigate the relationship between the IT adoption and firm focus.* These two aspects are independent. Firm focuses may drive the needs of IT adoption and IT adoption may help or enable the focus shift.
- *Incorporate more factors in addition to the IT adoption and firm focuses.* The possible

choices are industry types, corporate size, supply chain roles, etc.

- *Industry specific patterns.* The study can focuses on a specific industry (e.g. textile industry) to investigate the industry characteristics.

Acknowledgment

Some exemplary case studies are based on the discussion in the courses of supply chain management. We would like to thank those students, especially Mr. Daniel Leung for his case study on HMV. Thanks to Ms. Debbie Chu for the summary of several case studies. The research is partially sponsored by The University of Hong Kong under Seed Funding for Basic Research 08-10.

References

- [1] Yen, B. and Farhoomand, A. *Polo Ralph Lauren & Luen Thai: Using Collaborative Supply Chain Integration in the Apparel Value Chain*, Asia Case Research Center, 06/298TN, 2006. The University of Hong Kong.
- [2] Weill, P. and Aral, S. Generating Premium Returns on Your IT Investments. *MIT Sloan Management Review*, SMR 193, 2006
- [3] Yen, B. *Shun Sang (H.K.) Co. Ltd.: Streamlining Logistics Flow*, Asia Case Research Center, 03/161C, 2003. The University of Hong Kong.
- [4] Yen, B. *PGL: The Entrepreneur in China's Logistics Industry*, Asia Case Research Center, 04/207C, 2004. The University of Hong Kong
- [5] Lin, J. and Yen, B. *Highly Confident Transportation: Dynamics of IT Application in Supply Chain Management*, Asia Case Research Center, 08/392C, 2008. The University of Hong Kong.
- [6] Closs, D., Goldsby, T. & Clinton, S. Information Technology influences on the World Class Logistics Capability, *International Journal of Physical Distribution & Logistics Management*, H 1997, 27(1), 4-17
- [7] Lee, Hau. The Triple-A Supply Chain, *Harvard Business Review*, R0410F, October 01, 2004
- [8] <http://factory.lego.com/>
- [9] <http://shop.lego.com/Default.aspx>
- [10] www.sej.co.jp/english/
- [11] Farhoomand, A. *TAL Apparel Limited: Stepping Up the Value Chain*, Asia Case Research Center,, 05/214C, 2006. The University of Hong Kong.
- [12] <http://tech.it168.com/erp/2008-01-15/200801151242821.shtml>.
- [13] <http://big5.zjol.com.cn:86/gate/big5/biz.zjol.com.cn/05biz/system/2006/01/19/006449075.shtml>
- [14] <http://www.anc.org.cn/news/newsone.asp?id=384>
- [15] <http://www.wtlgroup.com/en/05contact/index.htm>
- [16] <http://www.wtlgroup.com/en/04track/index.htm>
- [17] <http://hbswk.hbs.edu/item/5518.html>
- [18] <http://www.hbs.edu/research/pdf/07-001.pdf>
- [19] <http://www.powere2e.com/about.php?aid=8>
- [20] <http://www.i18.cn/newscenter/news/guoneinews/2006-6-19/28290.shtml>
- [21] <http://www.idsgroup.com/investor/pdf/invinfo/2007AnnualReport.pdf>
- [22] <http://www.idsgroup.com/profile/technology.html>
- [23] www.bce.ca
- [24] <http://www.macrofoods.com.hk/>
- [25] <http://www.sunriserecords.com/>
- [26] <http://www.haier.com/abouthaier/corporateprofile/index.asp>
- [27] <http://www.wal-martchina.com/english/service/rl/rl.htm>
- [28] <http://walmartstores.com/Suppliers/248.aspx>

Table 1, Summary of Selected Case Studies

¹: (I, P): Informative (I1), Interactive (I2), and Integrated (I3); and Product (P1), Process (P2), and Personalization (P3)

Industry	Company Name	Current Position ¹	Expected Position ¹	Adoption of Exemplary System, Technology, and Strategy ¹	Upstream / Downstream Examples
Logistics	PGL Logistics Group [4]	(I2, P2)	(I3, P2)	<ul style="list-style-type: none"> • VPN-based XDI (eXchange Data interface) and XML technology (I2, P2/P3) • ERP system across the company (I3, P2) 	P&G
Apparel	Luen Thai [1]	(I1,P1)	(I3,P2)	<ul style="list-style-type: none"> • Re-position their business from an OEM to a design-to-store (D2S) provider in the value chain (I2, P2) • Adopt a Supply Chain City (SCC) model to speed up the product process. (I3,P2) 	
Toys	Lego [8,9]	(I2,P2)	(I2,P3)	<ul style="list-style-type: none"> • Online Sales Platform, customer can place order in the platform (I2,P3) 	
Retailer	7-Eleven (Japan) [10]	(I2,P2)	(I3,P3)	<ul style="list-style-type: none"> • Mobile Operations Terminals allows access to the item information in the store (I2,P2) • Retail information system to help store operators see which items (I2,P2) • 7-Exchange data system for category management (I2,P2) • Web portal for small suppliers (I2,P2) 	Anheuser-Busc, Kraft Foods, Pepsi Co,

				<ul style="list-style-type: none"> Adopt RFID for contactless payment acceptance at 7-Eleven stores. (I3,P2) 	
Books	Gordon and Gotch (Magazine Distributor in Australia)	(I2,P2)	(I3,P3)	<ul style="list-style-type: none"> PDA technology across its merchandise network (I1,P1) Technical solutions to its publisher clients for data analysis. (e.g. XchangeIT, Powerplay, Impromptu, Website) (I2,P2) Provide online services to facilitate the organization of different advertising / promotion (I2,P3) Information sharing with its parent group (PMP) (I3,P2) 	G&G, Parent Group
Logistics	Highly Confident Transportation (HCT) [5]	(I2,P2)	(I3,P3)	<ul style="list-style-type: none"> Real-time tracking system Digital signature and image authentication system for tracking the consignment status of shipments (I2,P2) GPRS tracking goods (I3,P3) 	
Apparel	TAL [11]	(I1,P1)	(I3,P3) (I3, P2/P3)	<ul style="list-style-type: none"> EDI standard for trade document (I2,P1) VMI offers backward replenishment tool (I1/I2, P2) ERP (I3, P2/P3) Made-to-measure(MTM) (I2, P2) 	J.C. Penny, Brooks Brothers.
Health Care	Shun Sang (HK) Co.[3]	(I1,P1)	(I2,P2)	<ul style="list-style-type: none"> Web-based system (I1,P2) PDAs and mobile phones (I1,P2) Barcode system (I1,P2) 	
Food and Beverage	Circle K (Supermarket)	(I1,P1)	(I2,P3)	<ul style="list-style-type: none"> IT system connection and inventory control system with its main suppliers, close communication with its main suppliers (I2,P2) 	British American Tobacco (BAT)
Food and Beverage	Carrefour (Supermarket) [12-14]	(I1, P1)	(I3, P2)	<ul style="list-style-type: none"> Central procurement system (I3,P2) EDI (I2,P1) 	Global suppliers such as Nestle Taiwan
Logistics	Wonderful Transportation Ltd [15-16]	(I1,P2)	(I3,P2)	<ul style="list-style-type: none"> Just-in-Time distribution center (I1,P2) Vendor Compliance System (I2,P2) Purchase Order Monitoring (I1,P2) Web portal for customers to track the delivery status (I3,P2) 	
IT and Electronics	Leitax [17-18]	(I1,P1)	(I1/I2,P2)	<ul style="list-style-type: none"> DMO (Demand Management Organization) synthesizes the data, manages the planning process, and resolves the conflicts. (I1/I2,P2) BAP function as a strategic plan (I1/I2,P2) 	
Food and Beverage	Lotus Supercenter (Supermarket) [19-20]	(I1,P1)	(I2,P2/P3)	<ul style="list-style-type: none"> Electronic process (I1,P1) WMS system (I1,P2) EDI and electronic workflows (I2,P2/P3) 	
Logistics	IDS (Member of Li & Fung Group) [21-22]	(I1,P1)	(I3,P2/P3)	<ul style="list-style-type: none"> Transportation Management Systems for vehicle routing and scheduling (I2,P2) ViTAL supports the aggressive growth of International business (I3,P2/P3) Trigantic - an online reporting system (I1,P2) Road Warrior - remote order taking (I2,P2/P3) TradEx - extends visibility of clients on transaction data (I3,P2/P3) 	
Telecommunications	Bell Canada [23]	(I2,P2)	(I3,P2)	<ul style="list-style-type: none"> Reliance on IT systems to provide automated business processes (I1,P1) Single terminal, a customer service agent (I3,P2) (2002) 	
Food and Beverage	Macrofood (healthy food provider)[24]	(I2,P2)	(I2,P2)	<ul style="list-style-type: none"> Database, provide product database for stock tracking and keeping service level (I1,P1) Barcode System (I1/I2,P2) 	
Music	Sunrise Records [25]	(I1,P1)	(I2/I3,P2/P3)	<ul style="list-style-type: none"> Online Music Store, partnered with mymusic.ca to launch an online music stores (I2/I3,P2/P3) 	Futureshop, Bestbuy, HMV,

					Wal-mart
Household Appliance Manufacturer	Haier (household appliance manufacturer) [26]	(I1,P1)	(I3, P3)	<ul style="list-style-type: none"> • Model “manufacture-store-sale” as the company operation model (I2,P2) • Logistics department (I2,P2) • CRM system (I2,P2/P3) • Standard platform for data sharing (I2,P2/P3) • Barcode System (I2,P2) 	
Food and Beverage	Wal-Mart (Supermarket) [27-28]	(I1,P1)	(I3,P2/P3)	<ul style="list-style-type: none"> • Retail Link allows Wal-Mart and its suppliers to manage the inventory efficiently (I3,P2/P3) • Customers can obtain first-hand information on new products through web (I2, P3) • RFID readers and transmitters (I3, P3) • Allow customer create their own “wish list” linked up to their customer account (I3, P3) 	HP retailink.wal-mart.com

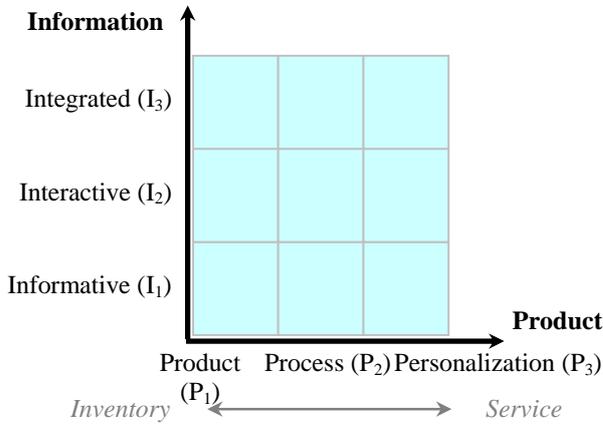


Figure 1. Framework of Strategy Position Map

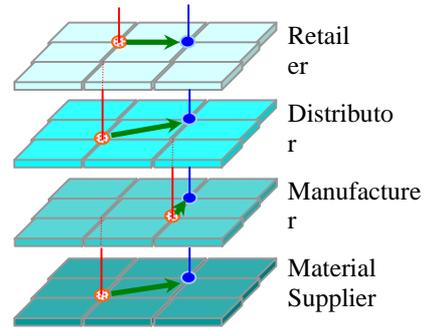


Figure 4. Strategy Coordination on Supply Chain

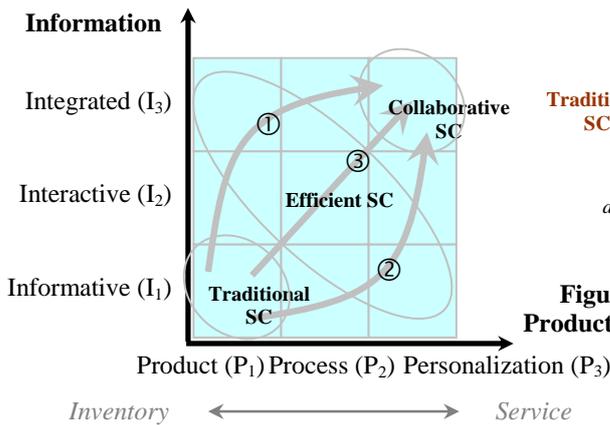


Figure 2. Types of Supply Chains

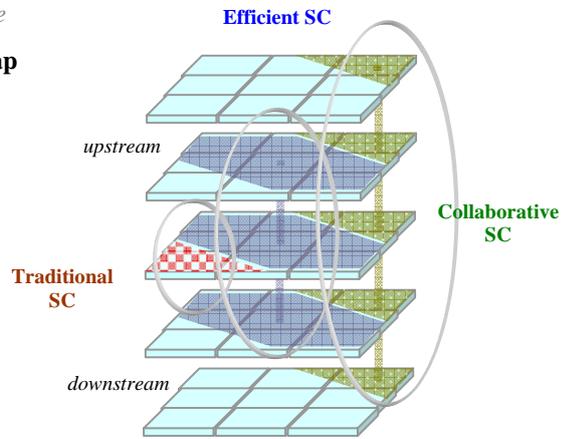


Figure 5. The Scope of Supply Chain Types

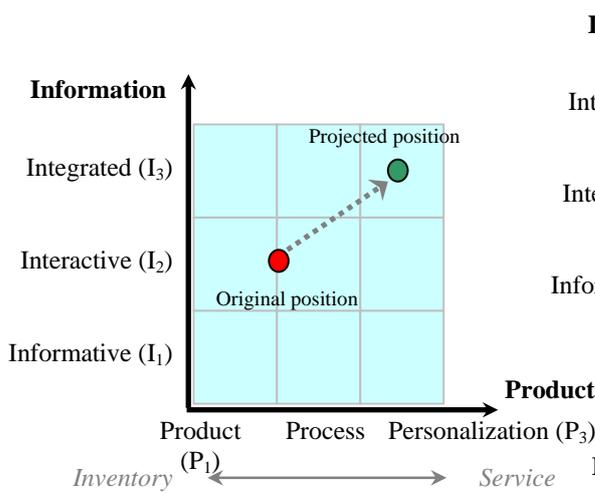


Figure 3. Strategy Position Map of HMV

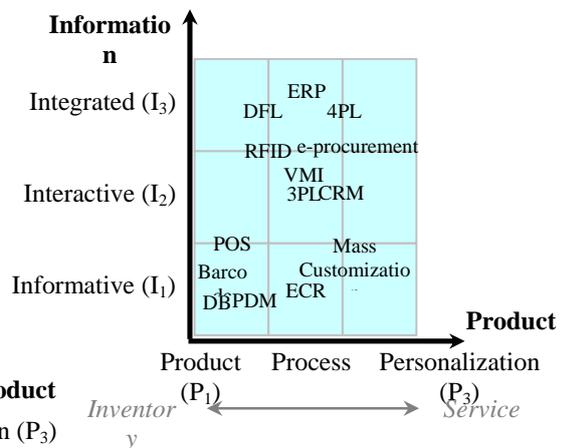


Figure 6. Examples of Technology Adoption