

To establish a CPFR business process implementation methodology base on SCOR model

陳星光¹ Chen, Hsing-Kuang 林我聰² Lin, Woo-Tsong

國立政治大學資管學系

台北市文山區指南路二段 64 號

E-mail: xyzpds@sparqnet.net Tel: 0929875135

國立政治大學資管學系

台北市文山區指南路二段 64 號

E-mail: lin@mis.nccu.edu.tw Tel (02) 29387650

Under the trend of globalize marketing, business firms are facing the challenges of operation efficiency and speed. Enterprises starting to get more attention on the capabilities of upper and lower-stream partners, abilities like quick response, connectivity and able to provide useful information for the company to gain greater advantage on globalize market.

The SCOR (Supply Chain Operations Reference-model) from Supply Chain Council provided the integration of supply chain management activities, which includes current business activities, business process activities and IT enabling activities.

Furthermore, VICS advocated a new collaborative SCM model CPFR (Collaborative Planning, Forecasting, and Replenishment) to decrease costs and increase sales by putting all members of partner in supply chain in a collaborative environment.

Concerning on the CPFR deployment we have found that CPFR only provided a general process model, no further explanation on each process function and lack of specific detail activities. Therefore deployment of CPFR sometimes occur difficulty.

In order to realize the critical factors for a company to successful deploy CPFR, several literature reviews were conducted in this thesis. In this research, we tend to develop an implementation methodology which contains both spirits from SCOR process model and CPFR collaborative model. Furthermore, the Plan section of SCOR model will be facilitate with CPFR process and separate into following collaborative planning field : 1)collaborative demand planning, 2) collaborative supply planning , 3) collaborative promotion planning , 4) collaborative transportation planning, 5) collaborative product development and 6) collaborative performance management.

Key words: CPFR (Collaborative Planning, Forecasting and Replenishment), SCOR (Supply Chain Operational Reference-model), Business implementation model

¹ e-mail: xyzpds@sparqnet.net contact number: 0929875135

² e-mail: lin@mis.nccu.edu.tw

1. Introduction

The globalization of market and manufacturing has forced the management of supply chain to focus on processes that penetrate networks of organization. A brief introduction SCOR and CPFR will be present to describe the general standardize supply chain reference model and the integration of supply chain services with collaboration and sharing information with each other. The overall purpose of this paper is to develop a collaborative supply chain planning model which can facilitate in general supply chain operation.

2. Supply Chain Operation Reference model (SCOR) and Collaborative Planning, Forecasting and Replenishment (CPFR)

In first section the general supply chain operation will be discussed and further more the idea of process decomposition will also be illustrated here. In the following, a brief CPFR nine steps process will also provided to get to a better understanding of how collaborative planning can be facilitate in general supply chain operation. Finally, section of collaborative supply chain planning model will be presented to illustrate the collaboration business process implementation.

2.1 Supply Chain Operation Reference model

The model defines common supply chain management process, matches them against “best practices”. It provides companies with powerful tool in improving supply chain operations. It allows manufacturers, suppliers, distributors and retailers with a framework to evaluate the effectiveness of their supply chain operations and to target and measure specific process operations.

The SCOR model was designed to enable companies to communicate, compare and learn from competitors and companies both within and outside of their industry. It not only measures supply chain performance but also effectiveness of supply chain reengineering. Further it has the ability to test and plan future process improvements.

The Supply Chain Operations Reference-model (SCOR) is a process reference model. At the core of this model is a “pyramid of four levels” that represents the path a company takes on the road to supply-chain improvement.(Supply Chain Council, 1998)

Level 1 Process type

The basic structure of the reference-model focuses on the four key supply-chain processes: Plan, Source, Make, Deliver and Return

Plan:

Under this process the company should assess supply resources, aggregate and prioritize demand requirements, plan inventory, distribution requirements, production, material and rough-cut capacity of all products and all channels. Make/buy decisions are evaluated under this heading. Decision related to long term capacity and resource planning, product phase in / phase out are undertaken in this phase.

Source:

Under this process sourcing infrastructure is managed. Various activities like vendor certification and feedback, sourcing quality monitoring, vendor contracts are conducted.

Make:

Under managing “make” infrastructure, engineering changes, facilities and equipment management, production status, production quality, shop scheduling/sequencing and short-term capacity are planned and managed.

Deliver:

Under order management activities like maintaining and entering orders, generating quotations, configuring product are undertaken.

Return:

Return of raw materials (to supplier) and receipt of returns of finished goods (from customer), including defective products and excess products.

Level 2 Process categories

Level 2 defines core process categories that are possible components of a supply chain. Organizations can configure their ideal or actual operations using these processes.

Level 3 Process element

Level 3 provides the information required for successfully planning and setting goals for supply-chain improvements. This includes defining process element, setting target benchmarks, defining best practices, and system software capabilities to enable best practices.

Level 4 Implementation level

Level 4 focuses on implementation, i.e. putting specific supply-chain improvements into action. These are not defined within industry standard model as implementation can be unique to each

company

This 4 level process reference model helps organizations capture the "as-is" state of a process with the objective to achieve the desired "to-be" future state. Further it allows organization to quantify the operational performance, establish internal targets based on "best-in-class" results in similar companies. Finally it characterizes the management practices and software solutions that result in "best-in-class" performance.

2.2 Collaborative Planning, Forecasting and Replenishment

CPFR is a Web-based attempt to coordinate the various activities including production and purchase planning, demand forecasting and inventory replenishment between supply chain trading partners (Gene, 2003).

A varied number of steps in the CPFR process have been identified depending upon the level of detail used to specify the process (Automatic ID News, 1998; Desmarreau, 1998, Schachtman, 2000a; Schenck, 1998a, b). Regarding to number of steps, CPFR uses a cyclic and iterative approach to derive consensus supply chain forecasts:

Step 1 Develop Front-end agreement

The agreement sets the objective of both business partners and also describes the actions and resources necessary for the successful application of CPFR. The jointly written paper defines the practical arrangement of the partnership, identifies the roles of business partners involved and establishes how

performance of each party will be measured.

Step 2 Create Joint Business Plan

Both parties work out a business plan taking into account their individual corporate strategies. The development of a common business plan improves the quality of projections in that available information from both parties is incorporated in the plan.

Step 3 Create Sales Forecast

The retailer's POS data and promotion planning provide the basis for the determination of sales forecasts.

Step 4 Identify Exceptions to the Sales Forecast

All products are identified which represent exceptions to the cooperatively determined acceptance of sales forecast. The exception criteria for each product are determined in the front-end agreement.

Step 5 Resolve/Collaborate on Exceptional Items

The steps concern the joint identification and clarification of exceptions to the forecast through real-time communication between the partners.

Step 6 Create Order Forecast

Data from POS is linked to the individual inventory strategies of partners to generate a specific order forecast. The short-term order forecast is used to generate actual orders. The long term order forecast flows into the overall

planning.

Step 7 Identify Exceptions to the Order Forecast

All products are identified which represent exceptions to the cooperatively determined acceptance of the order forecast.

Step 8 Resolve/ Collaborative on Exception Items

The steps concern the common identification and clarification of exceptions to the forecast through real-time communication between the partners.

Step 9 Order Generation

An order forecast becomes a firm order and accessing to appropriate technology and the availability of free resources.

2.3 Collaborative supply Chain Planning Model

With the SCM business process model and features of collaboration activities flow as a background, it is easily to facilitate a general supply chain reference model to detailed collaborative planning model. Martin, Niklas and Kristoffer (2002) had combine theories from VICS(2000a), Hoqua (2000), Norris et al. (2000) and Kalakota and Rbinson (1999) to propose a typical collaborative SCP process. In summary, six collaborative processes have been identified (see Figure 1) : 1) demand planning, 2) supply planning, 3) promotion planning, 4) transportation planning, 5) production development, 6) performance management.

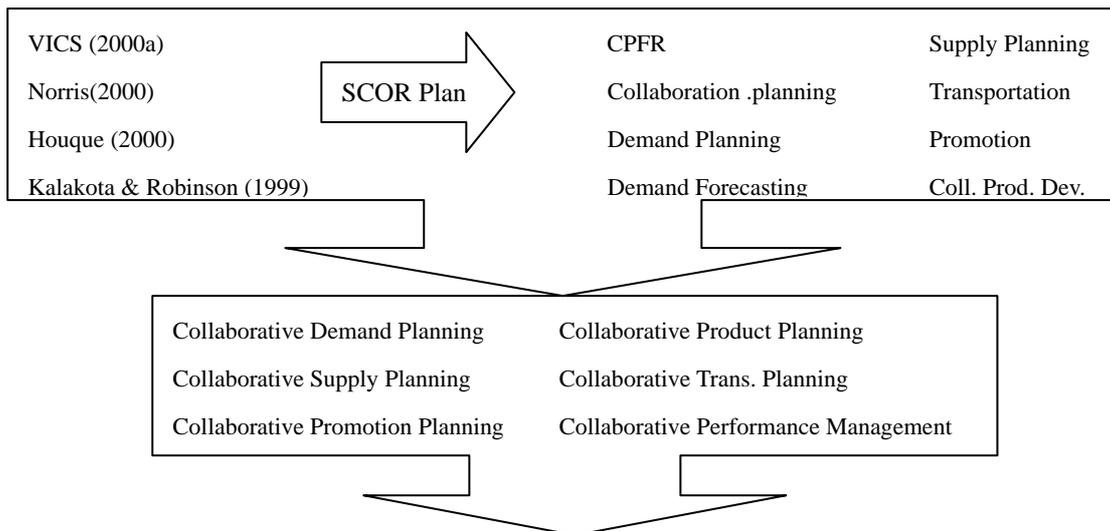


Figure 1: Collaborative SCP process
(Source: Martin, Niklas and Kristoffer, 2002)

In the theory of Martin, Niklas and Kristoffer (2002), they narrowed down the typical collaborative supply chain planning processes to only three processes in their theory, which are collaborative demand planning, collaborative transportation planning and collaborative performance management.

Form the perspective of business process implementation; further expansions on the collaborative supply chain planning process are needed. This paper dealing with full decomposition model of collaborative SCP from SCOR Level 1 to Level 4, in order to facilitate a successful collaborative business process implementation. Figure 2 shows the conceptual for decomposed model.

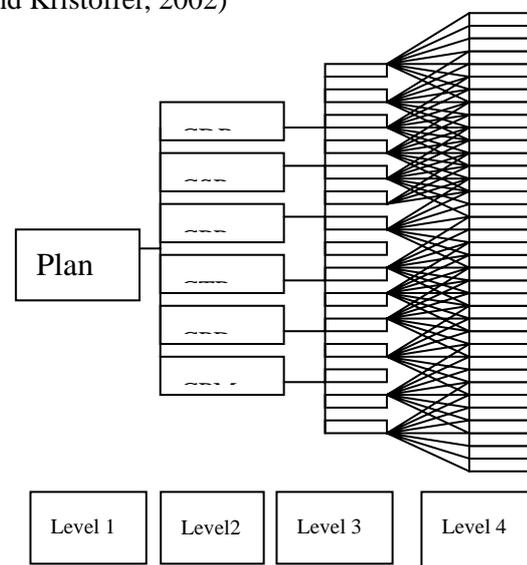


Figure 2 Conceptual model
(Source: Self evaluation)

Collaborative Demand Planning

By collaborating with supply chain members to establish a joint forecast, uncertainty on demand within the supply chain is reduced. This implies that it is possible to reduce some of the inventory, especially the safety stock, due to more accurate demand information. Both demand planning and demand forecasting aims to predict demand patterns from goods and

services. Activities for collaborative demand planning will be showing at below Figure 3

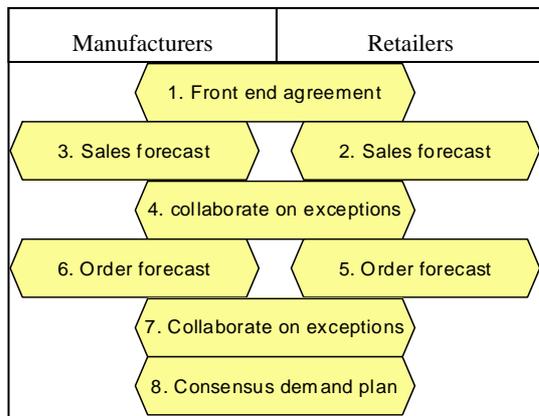


Figure 3: Collaborative Demand Planning
(Source: Martin, Niklas and Kristoffer , 2002)

Collaborative Supply Planning

When the collaborative demand plan has been agreed on, collaborative supply planning is the process that has to ensure that the demand plan can be fulfilled. The purpose of supply planning is thus to determine the production and purchasing requirements in order to meet the demand plan. Activities for collaborative supply planning will be showing below in Figure 4.

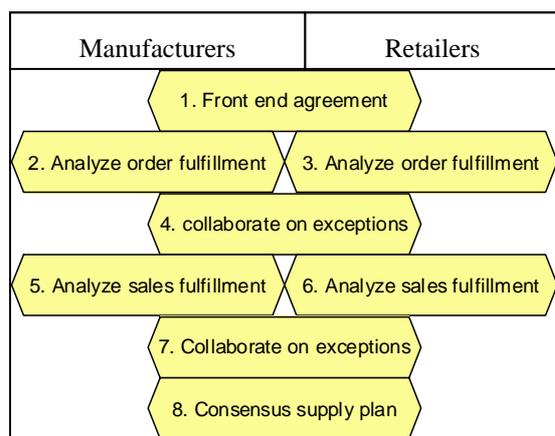


Figure 4: Collaborative Supply Planning
(Source: Self evaluation)

Collaborative Promotion Planning

Collaborative promotion planning is performed in order to establish a consensus plan for promotion activities. When there are price discounts, companies or customers tend to buy in larger quantities than needed and keep goods in stock until the inventory has depleted. This affects the demand pattern and does not reflect actual consumption which, in turn, contributes to demand amplification and less accurate forecasting (Lee er al., 1998). Figure 5 shows the various activities for promotion plan.

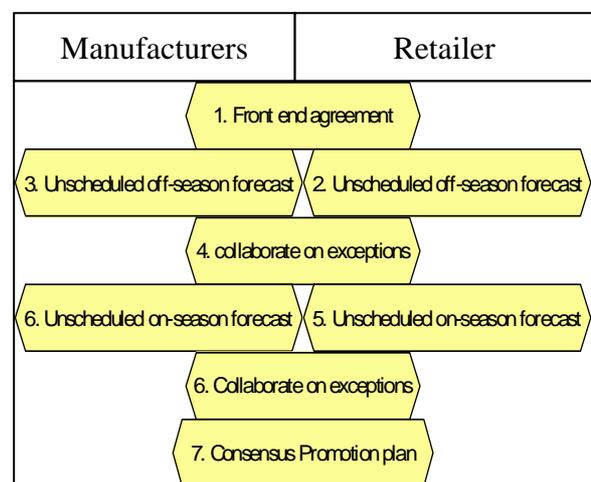


Figure 5: Collaborative Promotion Planning
(Source: Self evaluation)

Collaborative Transportation Planning

Transportation planning includes activities to ensure that material and finished goods will be delivered at that right time and to the right place. Collaborative transportation planning, typically incorporating suppliers, customers and carriers, would be more suitable on a vertical marketplace, where the members strive for a stable collaborative environment concerning systematic transactions of direct inputs. Figure 6 shows the activities for collaborative transportation management.

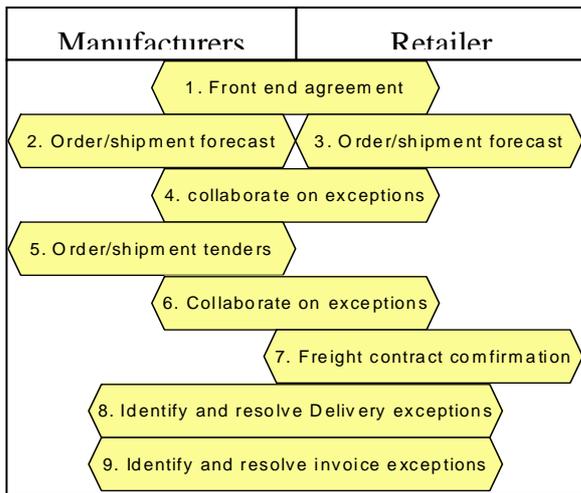


Figure 6: Collaborative Transportation Planning
(Source: Martin, Niklas and Kristoffer , 2002)

Collaborative Product Development

In recent year, there has been an increasing focus on concurrent, or simultaneous, engineering to shorten product development lead time, and thus the time-to-market for new product. Collaborative product development process is one way to meet the intense competition. Basically all participating organizations must coordinate their activities simultaneously, wherefore the key issue is communication and information sharing (Lee et al., 1998). Figure 7 shows various activities for collaborative product development process.

all activities for collaborative performance management.

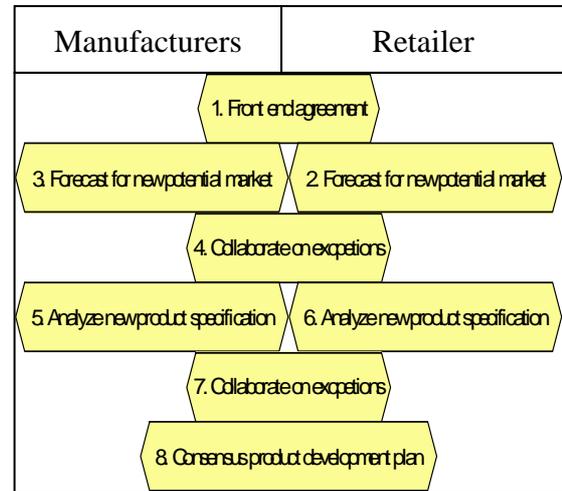


Figure 7: Collaborative Supply Planning
(Source: Self evaluation)

Collaborative Performance Management

Collaborative performance management will determine whether any mistaken during the entire collaboration processes which need to be justified and be arranged to next turn of collaboration process improvement planning. During this process all participants involved need to joint for the revision. Figure 8 indicate

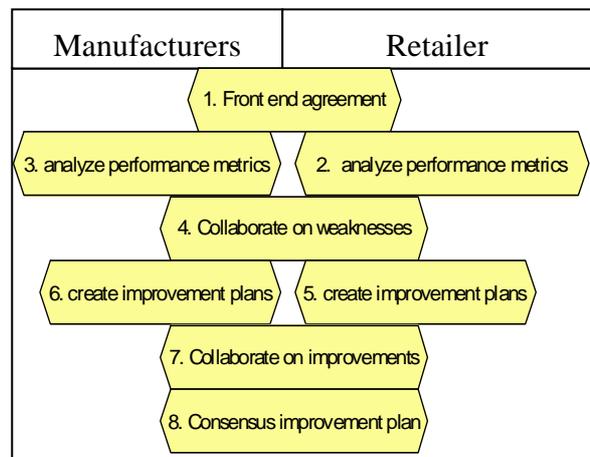


Figure 6: Collaborative Performance Management
(Source: Martin, Niklas and Kristoffer , 2002)

3. Conclusion

The globalization of market increased competition and brought forward inter-enterprise environment. Today competition in many industries is between supply chain and not just between individual firms. Consequently, there is need to collaborate between supply chain members and share accurate information to both upstream and downstream supply chain partners. Nerveless a feasible collaborate process implementation method is essential. Coordination, information sharing and trust have become the critical factors for synchronizing the demand and supply planning across the supply chain.

4. References

- [1] Cooper, M. C., Lamber, D. M. and Pagh, J. D., “*Supply Chain Management: More Than a New Name for Logistics*,” International Journal of Logistics Management, Vol.8, No.1, pp: 1-13, 1997.
- [2] Davenport, T. H. and Prusak, L. “*Working Know: How Organizations Manage What They Know*,” HBS Press, Boston, MA. 1998.
- [3] ECR Europe, “*A Guide to CPFR implementation*”, Brussels, 2001.
- [4] Fliedner, G. “*CPFR: an Emerging Supply Chain Tool*,” Industrial Management and Data Systems, 103/1, pp: 14-21, 2003.
- [5] Lee, H. L. and Whang, S., “*Information Sharing in a Supply Chain*,” Stanford Research Paper Series, Research Paper, no.

1549, 1998.

- [6] Lewis, L. “*Progressive Grocer*,” 79, 4; ABI/INFORM Global, pp: 28, Apr 2000.
- [7] Rudberg M., Klingenberg, N. and Kronhamn, K., “*Collaborative Supply Chain Planning Using Electronic Market Place*,” Integrated Manufacturing Systems, pp: 596-610, August 2002.
- [8] Rudberg, M. and Selldin E. “*ERP and the Internet: requirements for business process integration*”, Working Paper WP-289, Department of Production Economics, Linkoping Instituted of Technology, Linkoping., May 1998
- [9] Seifert, D., “*Collaborative Planning, Forecasting and Replenishment; How to Create a Supply Chain Advantage*,” Preprint Edition, Galileo Press GmbH, 200s2.
- [10] Supply Chain Council (SCC), *Supply Chain Operations Reference Model 5.0*, SCC, Pittsburgh, PA., 2003.
- [11] VICS, “*CPFR Voluntary Guidelines V2.0 June 2002*,” Voluntary Interindustry Commerce Standards Association, available at www.cpfr.org, May 2004.