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Research on the Collaborative Plan of Implementing High Efficient Supply Chain

-China's Consumer Goods Industry as Example

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Abstract

Consumer goods industry is a highly competitive field, and globalization and economic integration have a tremendous impact on the supply chain operation of consumer goods industry. Based on this, the paper first introduces the problems and challenges from channel demand chain, put forwards demand-oriented supply chain collaborative plan and its value, and then builds the framework of the collaborative plan, and briefly describes the characteristics of various activities and internal relationship between each other. Based on this, a case is introduced to be analyzed empirically. At last, the paper summarizes the key elements of successfully implementing the collaborative plan.

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After practical investigation, a well-known consulting firm finds that enterprises in the consumer goods industry often encounter demand chain problems of “Domino effect” type in the process of expanding the market and scale expansion: market demand uncertainty → Forrester effect → imprecision of plan → supply chain inventory fracture or backlog → falling expected profits due to delay of new products entering the market → failing to invest in research and development or market because of capital backlog → corporate decision-making confusion.

The company's research shows that there are two main reasons resulting in the above problems: Firstly, enterprises fail to forecast the real market demand precisely; secondly, enterprises' internal planning is independent from each other and lacks collaboration of integrated supply chain plan.

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1. Demand-oriented Supply Chain Collaborative Plan

*Actually, in the face of the above crisis, enterprises completely have the opportunity to improve it, and one of the solutions is that departments relevant to the supply chain within the enterprise should establish the supply chain collaborative plan based on quick response as a mainline.

Supply chain collaborative plan refers to the process by which the supply chain logistics department makes demand forecasts which continue updating based on historical and current market sales in the period of cycle, and determines and plans the internal integration process of manufacturing input-output, subcontract, inventory, promotion, price and product life cycle level according to them; on the other hand, the supply chain logistics department reinforces the information sharing with distribution partners, develops common strategies to accelerate the channel inventory turnover, compresses the outside integration process of product sales lead time, achieves the fullest demand chain satisfaction and win-win effect of the best inventory velocity through the comprehensive objective of coordinating production, market and finance, and ultimately realizes enterprises' profit maximization.

What is worth using for reference is that the industry leaders such as Wal-Mart, P&G, Dell and Unilever have realized various possible potential crises faced with the overall arrival of "demand chain oriented" era and decisively appoint their respective logistics planning departments to undertake the important task of supply chain collaboration, establish a quick market response system, thus pull the entire effective output of the supply chain and occupy the active market advantages.

As an organizer and coordinator of collaborative plan, the supply chain logistics department is responsible for the coordination of information and departments and needs to monitor, early warn and adjust several key plan variables regularly: retail terminal sales condition, channel sales smoothness, supply chain inventory health status, quick response of production and supply and demand change due to promotion and price adjustment. Once any of the variables changes, all the business departments associated with it will give quick feedback under the coordination of the logistics department and develop effective and common update plan to avoid loss and control cost.

2. Framework of the Collaborative Plan.

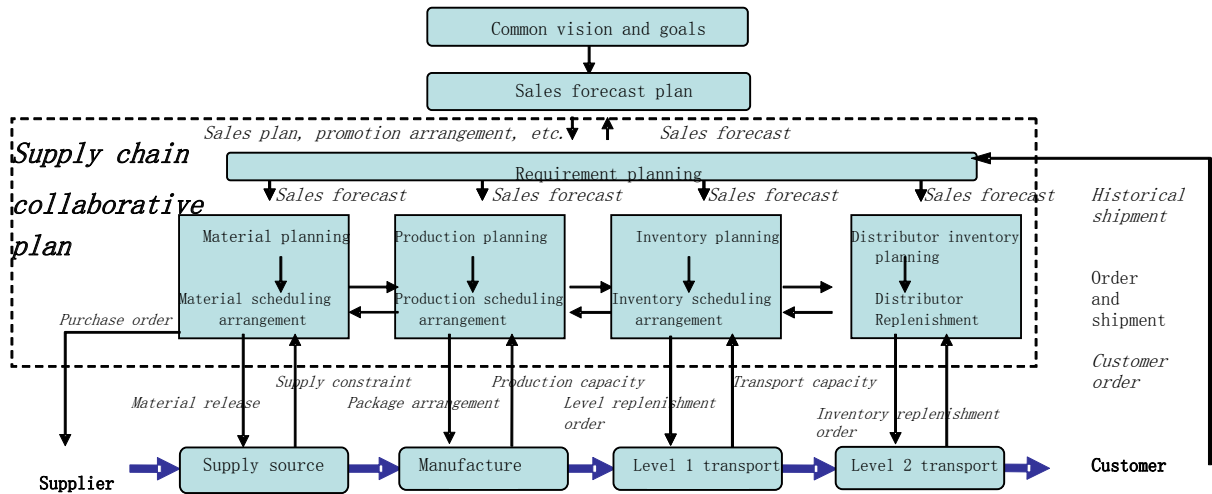
Collaborative plan reflects that enterprises center around demand chain to coordinate and plan the whole supply chain, while they guide the goals of action at all levels clearly. One accumulation of experience about the planning cycle is the basis for the next planning cycle, and thus enterprises' whole collaborative profits are constantly maximized instead of profit maximization for a single department and low profitability for the whole supply chain. The following figure simply summarizes the process and structure of the collaborative plan.

The structure of the figure shows: Medium-and-long-term vision is enterprises' strategic soul. The market demand-oriented collaborative plan system which is driven by the marketing plan includes almost all the enterprises' business flow which meets demand chain, and meanwhile the plan implementation is fully carried out through the processing, recording and reporting of enterprise resource planning(ERP)'s sales process and conversion into actual logistics transportation services.

The plan and coordination process integrates all the relevant plan activities by converting expected and actual customer demand into timely and executable demand notice, balances supply chain resources, meets demand chain's requirements and obtains maximum profits with the full support of logistics.

However, whether the sales operation mode enterprises choose is production according to inventory which is the "Push" type or production according to orders which is the "Pull" type, the process of sales operation plan (hereinafter referred to as "the process of supply chain collaborative plan") is the core link of

the whole plan and coordination process.



3. Example Analysis of the Collaborative Plan

Next the paper takes the collaborative plan practice of a famous multinational brand for example, and makes a rough analysis of developing a plan.

The international brand company is well-known for a variety of ice cream products globally. At present, the brand has a wide range of distribution in Chinese hypermarkets, supermarkets and different kinds of retail stores, scores a great success in China for ten years and receives high customer satisfaction. Through the interview and investigation with company’s seniors, it is found the reason the company can gain market recognition is closely related to quick supply chain support, and supply chain collaborative plan plays an important role behind this.

Supply chain collaborative plan is the centre and soul of the whole supply chain quick response system. Under the framework of enterprises’ annual、quarterly and monthly overall marketing plan, supply chain collaborative plan works out production and sales volume、stock、alternate order number、internal transfer number、forecast of new products entering the market、market forecast adjustment、sales analysis accuracy and so on. The optimal supply chain collaborative plan can be achieved through three stages: preliminary development (of plan), formalization (of plan) and adjustment (of plan) regularly.

Stage One, Preliminary development of plan

Company’s demand forecast is based on this model:

$$F_t = (B_t \times S_t \times T_t \times C_t \times P_t) + I$$

In the formula

- F_t —The forecast number of period t
- B_t —Basic demand level of period t
- S_t —Season factor of period t
- T_t —Trend component: Increase or decrease number of each period
- C_t —Cycle factor of period t
- P_t —Promotion factor of period t
- I —irregular number or random number

In order to prevent the excessive forecast caused by “Bullwhip effect”, the actual condition of channel turnover and terminal sales must be taken into account to take balanced consideration of the cost-optimal forecast point, because the backlog and stockout of inventory mainly result from it.

In terms of the general principles of supply chain collaborative plan, as a rolling plan, it monitors, analyzes and re-forecasts sales, supply, inventory and cost regularly, which provides senior management with a very effective and definite tool to take a comprehensive perspective of the market and enterprise operation and lays a solid foundation for timely adjustment and implementation of the strategy. Supply chain collaborative plan is carried out by logistics planners who organize each department manager for weekly and monthly planning meetings, and forecast and adjust short, medium and long term sales supply plans in real time. Through regular meetings (telephone conference, video conference), enterprises will carry out updated review, analysis and determination of several most important indicators in the short term (SRP) and in the medium and long term (MRP) which are demand forecasting, production supply, purchase adjustment, alternate order, date of new products entering the market, inventory surplus and future estimate.

Stage Two, Formalization of plan

Inside the enterprise, there are two key supply chain collaborative plan meetings every month in general, and general manager of the company, chief financial director, shop director, sales manager, production manager and logistics manager will attend the meeting. A logistics plan manager is responsible for scheduling meetings, arranging topics and presiding over the entire meeting, and the topics of the meeting mainly consist of:

- ◆ Comparison and description of the difference between sales forecast for last month and actual sales
- ◆ Comparison and description of the difference between the latest two quarters' sales of forecast for last month and forecast for this month
- ◆ Sales forecast for next month and supply plan
- ◆ Purchase plan
- ◆ Alternate order
- ◆ Plan of new products entering the market and promotion plan
- ◆ Scrapped inventory disposal

Before the meeting, the logistics manager will ask each department to submit the status information of demand forecasting and collect them to the information backup table of supply chain collaborative plan; when the meeting begins, each department supervisor will express their views on the basic key issues above, and the logistics manager coordinates each department's requirements to reach a final and common goal and then develops a monthly table of supply chain collaborative plan. (as is shown in the following table 1)

The table of supply chain collaborative plan takes months as the unit of measurement which accumulates to quarters and years. Variety refers to all kinds of taste specifications and inventory units, and the status analysis box of each variety contains about seven columns which are demand quantity, number of orders, supply, sales volume, alternate order number, internal transfer number and stock. To put it simple, demand quantity refers to production of demand plan this month; number of orders refers to actual production of order demand; supply refers to the factory's actual supply of production; sales volume refers to sales forecast for this month or actual production for this month; alternate order number refers to the number of orders which the factory hasn't completed; internal transfer refers to the internal use or allocation of unusual sales; stock refers to the expected inventory by the end of the month or the actual inventory at the end of the month.

Table 1 Table of supply chain collaborative plan

Variety \ Date		January	February	...	December	The first quarter	...	Year 2002
mango	Demand quantity	1000	1100					
	Number of orders	1000	1000					
	Supply	900	1100					
	Sales volume	800	1200					
	Alternate order	100	0					
	Internal transfer	0	0					
	Stock	100	0					

Each indicator variable has mathematical and logical connection with each other. Sales volume reflects the market sales department's monthly、quarterly and yearly sales goal and is determined according to the enterprise's actual capacity、market status and share、the expected goal in the market for that year and the market's actual consumption index and trend. Almost all of the activities within the enterprise are around the subject, such as market sales、human resource、finance、production operation、logistics、information、customer service, etc. Its goal is directly connected with planned production demand. From the perspective of the general operation of production and supply, enterprises will take the lead time of production and supply、material purchase cycle and optimal order quantity into consideration when developing a plan.

Stage Three, Adjustment of plan regularly

After the latest demand chain forecast and supply objective have been achieved through the meeting of supply chain collaborative plan, the logistics department starts to distribute the plan to production、sales、quality control、market、finance、customer service and senior management. All the related departments break the latest plan down into their respective specific operation plans which are material purchase plan、production plan、inventory plan、distributor inventory plan、maintenance service plan、plan of new products entering the market and financial forecast plan as are shown from the above figure. This series of plans are the organically connected and cross-interactive complex planning system which is limited by strict time instead of traditionally independent standard plans which are not linearly related; meanwhile they fully reflect the requirements of supply chain collaborative plan, and most importantly the implementation of plan breakdown should focus on ensuring the timely solution of problems in the demand chain from the specific operation. In turn, if each department finds the deviation between the plan and the actual situation in the process of implementing the plan, they will immediately give the information to the logistics department to ensure the importance of adjusting the plan or holding a temporary meeting.

Due to the efficient implementation of supply chain collaborative plan, the company's sales cost decreases by 15%, while the profit increases by 12%, and each department has generally raised their confidence and satisfaction of the company's development.

4. Key Points of Implementing the Collaborative Plan

Management master Peter M. Senge quoted the instance of “Beer Game” in “The Fifth Discipline” to make a very profound insight and analysis of the internal systematic connection among distribution、inventory and production, and thus extended systematic and global thinking and plan are very important for enterprises.

As an organizer and coordinator of the collaborative plan, the supply chain logistics department should make the collaborative plan truly promote the efficient operation of the supply chain from the following several aspects.

Firstly, not only avoid local thinking and take the overall situation into consideration, but also guide and coordinate the main business departments in the value chain to abandon the thought of standard benefit first; create a harmonious atmosphere of common thinking; look for efficiency and innovation space from every link faced with the fast change of consumer goods demand chain; achieve the maximization of overall long-term return on the organization’s interests.

Secondly, take regular, multi-angle and comprehensive measurement of accuracy of the plan which is the ratio of the difference between actual sales and planned quantity. The common method includes mean absolute deviation、average error、absolute error、percentage error and setting target value of plan precision. For example, more than 90%, make an assessment of the whole year’s performance and avoid short-term violently fluctuating one-sidedness

Finally, determine the problems which should be paid attention to next time by making a regular assessment of plan precision performance to achieve the continuous improvement of plan precision and completeness.

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