COLLABORATIVE FORECASTING, PLANNING, LOGISTICS AND REPLENISHMENT MODEL: THEORY AND MEASUREMENT

by

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ABSTRACT

This paper presents a theory and measurement of Collaborative Forecasting, Planning, Logistics and Replenishment (CFPLR) based on the researcher’s earlier research in this area. It is introducing the basic concept of CFPLR and definitions of measurement relevant to probability theory. The scorecard that is author’s tool in this research is used in assessment the theory and all stakeholders’ performances in term of collaborative short and long term forecasting, planning development, logistics activities and replenishment strategy.

KEYWORDS
CFPRL, Supply Chain, Logistics

INTRODUCTION

Collaborative Forecasting Planning Logistics and Replenishment model defines “two or more chain member working together to competitive advantage through sharing information, making joint decisions, and sharing benefits which result from greater profitability of satisfying end customer needs than acting alone” (Simatupang & Sridharan, 2005). It is adapted from CPFR (VICS, 1998) that is applying logistics management. There are 9 steps that focus on improving accuracy of order and sale forecast, logistics and supply chain management and replenishment. This model requires cooperation in supply chain activities with Information Technology. In addition, Supply chain and logistics management highlight network which includes upstream to downstream or supplier to end user. Cooperation is data and information sharing such as order planning, inventory management, production, transportation and delivery. These can increase efficiency and performance of business such as accuracy data interchange, low costs and high profits, and reduce uncertainty along the supply chain. It can be seen that CFPLR can support stakeholders to maximize profits, and customer royalty in long term.
What is CFPLR model?

The CFPLR planning process structures that relates to steps of the implementation process of CPFR. The model is divided into four phases. Phase one consists of forecasting (steps 1-4), phase two is planning (steps 5-6), phase three is logistics (steps 7-8) and phase four is replenishment (step 9). Figure 1 illustrates CFPLR process model. The following description is explained the nine steps of CFPLR model.
Step 1 Create demand and supply forecasting

Create Demand Forecasting

In this step, POS data, marketing analysis provide the basis for the determination of sales forecasts. Demand forecasting all supply chain may reliable and supports strategy in business. It should convey the intentions of the business plan at a higher level of detail.

Create Supply Forecasting

Partners have connected in inventory management that they have different inventory strategy and forecast. It can be seen that high volume relates to inventory management, type of products and destination of the commodities.

Step 2 Create join order and sale forecasting

From the previous step, all of them have individual strategies. Data are linked and share to generate a specific order and sale forecast that are developed from details of suppliers, retailers and customers. Moreover, short-term and long-term are separated as short-term is used to generate actual orders and sale. The long-term order forecast flows into the overall planning.

Step 3 Identify Exception Items

Identify Exceptions for Sales Forecast

In this step, all products are identified that represent exceptions to the cooperatively determined acceptance of the sales forecast. These can be seasonal products, for example. The exception criteria for each product are determined in the front-end agreement.

Identify Exceptions for Order Forecast

In this step, all products are identified that represent exceptions to the cooperatively determined acceptance of the order forecast. The result is a list of those articles that, on the basis of the criteria in the cooperation agreement, represent exceptions.

Step 4 Resolve Exception Items

The step concerns the joint identification and clarification of exceptions to the forecast through real-time communication between the partners. Each change flows immediately into the new forecast. The accelerated communication and decision making by producers and retailers increases the reliability of the order that is generated later.

Step 5 Develop Collaborative Arrangement

This step is rules and regulations of cooperation in partners. The agreement is set about the objective of business partners. It describes the actions and resources necessary for the successful application of CFPLR. Details are related to roles of business partners, control and performance measurement. The actions can be summarized as follow:

1. Develop CFPLR mission statement. The development of a mission statement creates a common basis for cooperation, trust, and availability of resources. The following components of step 1 address in detail the content of the mission statement.

2. Determine CFPLR goals and objectives. Determination of concrete goals and tasks entails agreement on the appropriate indices for measuring performance. Additionally, the business practices and criteria for exceptions purchasing and the forecasting of orders is established.

3. Discuss competencies, resources, and systems. The CFPLR process demands a clear determination of the competencies, resources, and systems of all parties involved and their capability to contribute to the process. Which departmental or functional groups are ready and able to contribute to the process long term? Which additional capacities must be expanded or outsourced?
4. Define collaboration points and responsible business functions. Map the collaboration points to trading partner competencies and establish the responsible business functions (functional departments) that will be the key executors of the process.

5. Determine information-sharing needs. The CFPLR process requires information from both manufacturers and retailers. Identifying the demand for information determines which information will be shared, for example, data on the identification of forecast anomalies. Furthermore, the frequency of the exchange, the medium of the exchange, the allowable response time before information requests are honored, and the forecasting method must be determined.

6. Define service and ordering commitments. This activity lays out the nature of order and delivery commitments in the framework of the CFPLR process. This pertains especially to the phase in which collaboratively determined projections become firm orders.

7. Determine resource involvement and commitments. In this step, both CFPLR partners establish which resources will be made available. This means, for example, how much time and how many employees will be devoted to the CFPLR process. This is true of resource allocation for the work process, agreements on process management, and how initiatives like process improvement can be integrated into the system.

8. Resolve differences between partners in the CFPLR process. This activity comprises the standardization of rules for handling disagreements and differences between partners. Should something be contested, it is important to have measures for conflict resolution in place to which all have agreed.

9. Regularly review cycle for CFPLR agreement. This step is designed to establish a continual evaluation and to benchmark the success of the collaborative relationship. The agreement is modified whenever necessary.

10. Publish front-end agreement. The jointly composed agreement becomes binding for all participants in the process. The agreement can be updated at any time to reflect new demands or developments.

**Step 6 Create Joint Business Plan**

After the partners have the same agreement, they discuss and work out a business plan. They include category management, roles, approaches and articles. Furthermore, they support each other in terms of collaborative marketing and accounting planning and vendor management. This new business plan improves quality and earns more profits from accuracy appropriate platform for communication and coordination along the supply chain.

**Step 7 Develop Logistics design**

Develop logistics design in partners along supply chain that is a concept on supply chain to improve customer service level and reduce logistics cost. There are transportation costs, inventory costs and distribution costs. All partners present their logistics structure design. The logistics design can be developed in this step.

**Step 8 Joint Logistics Planning**

Collaborative Logistics Management is used for logistics planning selection that is linked to all stakeholders’ data and strategy. The best logistics planning will be specific for this commodity. In addition, this step also increases value chain and efficiency that consists of:

1. Reduce waiting time in transportation and delivery.
2. Vehicles of supply chain network are more efficient.
3. Times Scheduling in echelons is optimization.
4. Decrease long haul distances and accidents.
5. Decrease missed transaction and poor communication among supply chain.
6. Inventory and replenishment is more justified.

**Step 9 Order generation**

The final step in the CFPLR process is generating the order and promising the delivery. The essence of maintaining positive relationships along supply chain is to deliver on promises.
Why should we have CFPLR agreement?

Generally, supply chain has many stakeholders that are upstream and downstream stakeholders (Walker, Rowlinson, & Bourne, 2008). They also have different strategies, production, management and approaches. It is possible that there are caused of high inventory, high costs, and poor performances. First of all, partners whom prefer to use CFPLR model, have agreement in supply chain.

Stakeholders in supply chain have agreement as follows:

1. Conceptual of stakeholders who join this agreement. They will accept conditions that include type of business, framework, procedures, and responsibilities in CFPLR process.
2. Stakeholders agree that they will use collaborative forecasting, information sharing, logistics management, and solve problems such as inaccuracy information, high costs and poor performances. The result concerns the only optimization of forecasting along supply chain.
3. All stakeholders focus on the same approach. There is decreasing waste that consists of waiting, overproduction, transportation, inventory, movement, extra processing steps, and defects or integrating activities in supply process (Poppendieck & Poppendieck, 2003).

Supply Chain Measurement

Collaborative Forecasting, Planning, Logistics and Replenishment model is the new theory as the researcher references measurement about supply chain collaboration (Sanders and Premus, 2005) (Holmberg, 2000), Supply Chain Operation Reference Model (Huan, Sheoran, & Wang, 2004) (Stewart, 1997). Bolstorff and Rosenbaum (2007) illustrated that the supply chain measurement provides a common process oriented activities for communicating of supply chain partners in case of Plan (Demand/Supply Planning and Management), Source (Sourcing Stocked, Make-to-Order, and Engineer-to-Order Product), Make (Make-to-Stock, Make-to-Order, and Engineer-to-Order Production Execution), Delivery (Order, Warehouse, Transportation, and Installation Management for Stocked, Make-to-Order, and Engineer-to-Order Product) and Return (Return of Raw Materials and Receipt of Returns of Finished Goods).

The attributes of supply chain performance defines as follows:

1. Supply chain reliability: the performance of supply chain in delivering the correct product, to the correct place, at the correct time, in the correct condition and packaging, in the correct quantity, with the correct documentation, to the correct customer.
2. Supply chain responsiveness: The speed at which a supply chain provides products to the customer.
3. Supply chain flexibility: The agility of a supply chain in responding to marketplace changes to gain or maintain competitive advantage.
4. Supply chain costs: The costs associate with the operation in supply chain.
5. Supply chain asset management: The effectiveness in managing asset to support demand satisfaction.

The level in supply chain measurement

Level 1 is the top level of this measurement. It is defined the scope and content of the core management process for above-mentioned decision areas. Organization can set up goal and competitive advantage and improve supply chain efficiency.

Level 2 is configuration level. The characteristics are described as associated with the following process type: planning, execution, and enable.

Level 3 is process element level. This level provides detailed process element information for each level 2. There are process element definitions, process element information inputs, and outputs, process performance metrics, best practices, where applicable, system capabilities required to support best practices and systems/tools.

Level 4 is supply chain collaboration level. This involves partner agreement and collaborative planning. There are information sharing, decision synchronization and incentive alignment practices and ultimate the collaboration index.
REFERENCES


