

# COLLABORATIVE PLANNING, FORECASTING AND REPLENISHMENT: STATE OF ART IN BRAZIL

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## **ABSTRACT**

This work describes the current state of Collaborative Planning, Forecasting and Replenishment efforts in Brazil and relates the collaboration process between industry and retail, identifying and analyzing benefits and hindrances in its implementation, besides potential reductions in transaction costs. Two cases were studied in industrial companies and their respective retailers of the consumer packaged goods (CPG) supply chain. Researching both cases, it was observed that the Brazilian CPG industry presents a more intense collaboration and technological innovation initiative than the retail sector. Also, frequency in transactions, deriving from informational symmetry, and high specificity of human assets are important factors to effective collaboration.

**Keywords:** collaboration, supply chain, information technology, transaction cost economy.

## **INTRODUCTION**

Supply Chain Management (SCM) employs a wide number of information systems among all the participants. Being the integration of business processes among trading partners of paramount importance, collaboration in the supply chain is the first step for an improved data exchange, strategic use of information and homogenization of systems used for effective communication. As part of the integration mechanism among these processes, the Collaborative Planning, Forecasting and Replenishment (CPFR) Model is a valuable technological innovation tool to strategically, tactically and operationally support the implementation of several types of transactions among the agents.

This paper has two objectives: to present CPFR implementation cases in Brazil as a technological innovation, describing interaction issues between strategic partners during that process and to suggest actions in order to reduce transaction costs along the supply chain, using insights inspired by the New Institutional Economy (NIE).

Such collaborative initiatives have been adopted in Brazil between retailer market and industry for about two years, and CPFR for about twelve months (Gazeta Mercantil Data

base, 2001). However, due to its novelty, studies are still in their preliminary stage and mean - with this research - to verify how its concepts are being used in practice.

Two consumer packaged goods industries and their respective retailers (clients) were studied. Through information obtained from these four companies, it was observed that collaboration is fundamental for both partners in the chain, and that CPFR is a valuable strategic information technology (IT) tool to execute transactions among these agents. However, though considered important, collaboration in the supply chain through CPFR is still embryonic, little developed in the Brazilian market (Integration Consultoria Empresarial, 2002), probably due to little knowledge about this collaboration model, and the low stage of technological innovation in the retailer market.

### **COLLABORATION AND INFORMATION TECHNOLOGY IN THE RETAIL MARKET SUPPLY CHAIN**

Having in mind that modern commercial (retail) relations in Brazil started in the 1960s (Bignetti, 2001), history shows that little has been done concerning technological innovations when compared to developed countries, where IT resources are used to enhance relations among suppliers, clients and final consumers.

In the 1990s, the supermarket sector exposure to globalization, due to the arrival of large international retail chains, caused a pronounced competition process, which generated a modernization impact. The retail market was exposed to innovation technology fronts that allowed the use of more advanced IT techniques.

In such an environment, strong competition pushes companies to permanently search for technological innovations that allow to achieve better competitive positions, in an increasingly dynamic way.

Considering that new forms of IT solutions and new alliance processes have been intensified by organizations in order to provide a fast and accurate response to consumers, the decision of adopting Efficient Consumer Response practices was the first step for suppliers, distributors and retailers to get organized around a strategy – the search for efficiency in the entire supply chain.

According to Martins and Alt (2000); Takaoka (1997), by means of IT, retail chain members would be prepared to maximize their performance, adapting to external changes. However, IT by itself does not provide a full solution. In addition, strong integration among suppliers, distributors and retailers is necessary, so as to reduce costs along the chain.

In this sense, collaboration in the retail chain is of paramount importance for the success of data exchange and the use of strategic information, besides transaction cost reduction. Aiming at succeeding at this, CPFR was created, translated into the ability to respond to clients' demands in advance, by means of collaboration between the supplier and the client, in search of a shared understanding of new cost demand-supply relationships.

### **CPFR AS A TECHNOLOGICAL INNOVATION DRIVER**

CPFR is a set of norms and procedures created by VICS, the Voluntary Interindustry Commerce Standards Association (WHITE, 2001), driving companies towards common business planning procedures, and searching for higher efficiency in the supply chain by

establishing standards to facilitate the physical and informational flow. These norms allow buyers and sellers to collaborate in forecasting and ordering, so they can regularly update their business plans based on such information exchange, which would conduct client's stocks to optimal levels and also reduce supplier's inventory. That is, collaboration is strongly supported by trust among partners. Collaborative control also allows a better production and distribution planning so as to optimize the balance between cost and service.

Besides, innovation is a continuous learning process and does not always mean to do something new, but rather do something better than the others (Tidd and Pavitt, 2001). Therefore, CPFR can be taken as a competitive advantage, considering the constant need of innovation in organizational processes and investments in IT.

In industries with intense technological change, turbulence is the general rule, and stability the exception. In order to survive, economic actors create new competitive rules and establish innovative strategies for swiftly altering processes (Arthur, 1996). The retail market, in general, behaves as a high uncertainty environment and requires fast responses for new consumer habits. More and more, consumers are demanding new products, with high quality standards. This drives companies to innovate business processes and products, which have their life cycle dramatically reduced.

Consequently, innovation can be said not to be an isolated event and, therefore, for a better result to be attained, management is necessary. Like CPFR, managing business processes require both internal and external knowledge about the company in the supply chain, as the development of effective behavior standards influences operational processes on a daily basis among partners in the chain. CPFR, when successfully applied, may even reduce transaction costs in the supply chain.

In Brazil, the CPFR initiative is supported by the ECR-Brazil Efficient Replenishment Committee.

### **TRANSACTION COST ECONOMY AND VERTICAL COORDINATION**

According to Williamson (1985), transaction costs result from economic system movements and its analysis is essential for decision making, when choosing different forms for the firms to get structured, be it in the simplest form of marketing (free trade), be it in hierarchy (vertical integration), passing by hybrid forms that fit different cases. These governance forms are translated into alternative tools for production/contracting decisions and for comparison among agents within the organization in a static way, that is, without considering technological innovation aspects, uncertainties of long-term contracts, and variations in the firm internal environment. On the other hand, Langlois (1992) treats transaction costs in real time and describes the firm environment as a conjunction of dynamic events. Despite presenting divergent aspects concerning the analysis of transaction costs, Williamson (1985) states that governance structures aim to regulate a certain transaction, and may even reduce their costs. Hobbs (1996); Stanley (1998) claim that transaction costs are incidental costs of some exchange, represented by information, negotiation and monitoring costs.

So, in order to better analyze the forms of governance, Williamson (1996); Williamson and Masten (1999) detach three dimensions of transactions that are essential for analysis and to

shape the core of Transaction Cost Economy (TCE): the phase of asset specificity, uncertainty and frequency at which transactions are realized.

The high asset specificity contributes to the bilateral dependence relationship between economic agents (Williamson, 1993; 1991). Thus, each investment must be made aiming to cut production costs or to increase their profitability.

A deeper knowledge among agents reduces uncertainties (which contributes to decrease vertical integration) and increases the frequency (in which transactions tend to be repeated in the absence of opportunistic actions), which results in greater trust and in building a reputation (Zylberstajn, 1995).

The organization of contracts, analyzed in detail by Demsetz (1972), is important for defining the incentives and controls in the supply chain. The definition of these controls and monitoring forms may lead to a collaboration behavior among agents.

### **RESEARCH QUESTIONS**

The aspects herein exposed, among others, guided the study of both cases (still in a preliminary phase of CPFR implementation), which will be presented in the next topic. In order to drive the research, the following questions were made.

- Considering technological innovation gaps of the interviewed companies, has CPFR strategically been implemented as a new IT tool in order to support the collaborative aspects in the retail supply chain?
- What are the implications of implementing CPFR for improving the logistical system efficiency? Does it fit in the retail and manufacturer actual conditions?
- Does collaboration decrease or eliminate the governance power by one of the agents in the supply chain?
- Attempting to turn collaboration into a formal relationship, is the contract suitable to the proposition?
- Are transaction frequency and human asset specificity key concepts in the collaboration process?

### **CASES DESCRIPTIONS**

Both ongoing cases, called pilot cases, are descriptive, once they attempt to present the industry-retail channel characteristics in Brazil. At the same time, the work is based upon an exploratory research, where interviews were carried out aiming to obtain detailed information on this relationship.

The research refers, on the one hand, to CPG world-class industries acting for over a century and, on the other hand, small Brazilian retailers with an increasing performance in the use of IT solutions in order to produce innovation.

### ***CPFR: AN ADAPTATION TO THE BRAZILIAN REALITY***

The cases to be described seek to follow a sequence of steps that are foreseen in a guide (ECR Brasil, 2003). It is based on rules and procedures, that is, on the nine steps elaborated by the VICS international committee, and adapted to the Brazilian reality. The steps in this guide are described as follows: *step 1 – strategic alignment; step 2 – tactic design; step 3 -*

*demand design; step 4 – replacement design and step 5 – efficient replacement* (ECR Brasil, 2003).

The first step, already implemented by the two pilots, generally aims to establish collaborative process rules and principles, as well as confidentiality agreements. It also has to define responsibilities and utilization of resources, competencies and systems involved in the collaborative relationship process. Specifically, it seeks first to describe, by means of formal evaluations (questionnaires), the CPFRR collaboration and understanding stage by each partner and, secondly, to define the common strategic goals and objectives, the product categories, the standard collaboration process, the revision deadlines and the Key Performance Indicator (KPI) in the agreement.

The confidentiality agreement is formalized by both parties; however, it has a general character, so as to guarantee alignment and compromise between the partners, without sticking to the peculiarities of a formal contract, and allowing, as far as possible, the progress of trading transactions. That is, in general terms it makes room for industry and retail transactions, without the need to design a rigid contractual structure for each promotional item, or for each phase of transaction. According to those interviewed, the strategic alignment usually needs a realignment so as not to lose focus on the transaction.

#### *COMMON HINDRANCES AND BENEFITS TO THE PILOTS WITH THE IMPLEMENTATION OF CPFRR*

- *Manufacturers*

CPFRR implementation goes the full range from strategic to operational, as it is not only focused on production/logistics but also on the architecture of the transaction with the client. This reflects future gains, a result of an effective collaboration and of the incentive to break paradigms.

Hindrances are mainly represented by cultural changes. Each company has its own way of doing operations and, when some partners also fail to invest in technology, the difficulty is even worse, for sometimes they lack knowledge on what is being proposed.

A second point, which was hopefully an incipient and transitory difficulty, was the high degree of informality in operations, making it impossible to exchange structured information with the retail partners, which also have a history of low investment in IT. The industry stimulates its retailers to invest in IT and to optimize exchange processes, even if at first glance the gains deriving from this collaboration process are not the ones desired. In this sense, the frequency of transactions has increased, maintaining the same allotment.

The third point is the inadequacy, or even lack, of business processes on the retail side, which sustained and concentrated CPFRR efforts on a single person, risking the whole learning of the collaboration process.

The industry counts on an organizational structure composed of functional teams such as finance, logistics, marketing, sales and IT, with members from trading areas in all of them. After defining the scorecard, the industry monitors the performance of promotions through the sales channel, which allows to measure the frequency of transactions and, consequently, profits and losses.

As benefits, the collaborative initiatives have resulted in: (a) delivery of goods along the month, as opposed to the traditional practice of concentrating 60% of the sales on the last

tree days of the month; (b) better demand forecasting; (c) reduction in total transaction time in the chain; (d) better information exchange; (e) standardization of delivery processes and data exchange as well as (f) improved relationship with the partner.

- *Retailers*

The CPFR implementation has a more operational focus, aiming at fast and measurable results, as the culture is still focused on prices and quantities (purchase by lots), therefore opportunistic. This reflects a different strategic standpoint from the industry.

The hindrances are represented by an inadequate organizational structure and the lack of CPFR formalization as a business process.

The benefits are: reduction in stocks at stores and at distribution centers (DCs), drastic reduction in out-of-stock rate at the display shelves, linearity of delivery along the month, reduction of logistic costs, improved relationship among partners and standardization of processes.

#### *PILOT "A" – MANUFACTURER*

Based upon intellectual capital, the case "A" CPG industry operates in more than 80 countries worldwide, with a mix of about 250 products in several segments (such as hygiene and cleaning, pharmaceuticals and food). In Brazil, its operational structure is divided into two factories and a central DC, with a direct communication channel with retail partners. Annual revenues exceed US\$ 300 million.

About three years ago, the industry used collaboration in its old fashioned form (based on trust and on negotiation); however, it had already introduced the implementation of the Vendor Managed Inventory (VMI). The partner (retailer) had an informal and poor forecasting plan to give to the industry. Later, with the implementation of CPFR eighteen months ago, the industry started to forecast joint demand with the partner one month in advance, and promotions were strategically established at least twelve months in advance. The forecasts are based on history periods and opinion polls are carried on directly with final consumers, followed by quarterly contracting (for promotional products), with a reference programming cycle. At the beginning of the project, 60% of monthly sales were concentrated in the last week of the month, incurring in higher freights and an 8-hour average waiting time to unload. Today, the replacement volume in the last week was reduced to 35%, freight costs dropped 50%, and the average waiting time was reduced to 1 hour and thirty minutes.

After the first step, as the relationship become more personal (one of the pillars in collaboration), the partners evolved directly to the last step. At this point (after six months of replacing promotional items), based on collaboration processes and use of VMI, the partners began to exchange data via Electronic Data Interchange (EDI). Also now, the industry can directly access the retailer database in order to find out actual demand, which was formerly measured by the aggregate sales at the distribution center. Seeing that promotional items frequently change, the industry reports that the implementation of step two is necessary to cover situations unforeseen by VMI.

According to the industry, after the application of the two steps (1 and 5), the remaining ones may provide greater benefits, as they improve sales forecasts, planning, promotion visibility and help to define the annual promotion schedule more precisely.

The company policy is not to force products into consumers but try to forecast new needs and trends. Therefore, direct consumer polls are fundamental and essential for the replacement to be nimble and without incurring in out-of-stocks on the display shelves.

According to the industry, maybe the greatest learning has been the implementation of step five just after step one, since it provided immediate results for the retailer. This is fundamental for the partner short-term planning, stimulating it to keep investing in collaborative planning, as results can be obtained earlier. Beginning by the fifth step may be more relevant to the logistic area and provide a better argument to sellers that it is possible to perform transactions collaboratively, since gains are real. In this case, the corporate culture had a strategic role, making the partner realize the benefits generated by collaboration.

#### *PILOT "A" – RETAILER*

With twenty stores and two DCs, this southern-based, mid-sized, regional retailer has been intensifying collaborative relationship with its industry partner, using VMI as the main inductor in the process. Its success leads the retailer to include all sixty SKUs (100% of the whole transaction) within the CPFR process.

According to those interviewed (owners), the history of the relationship, the synchrony and the resemblance in business processes made collaboration easier, although their IT competence, resources, and strategic planning are smaller in scale than those of the industry partner. Also, they could not afford a specific project team, concentrating efforts on an individual.

The first step for implementing CPFR was informal. Transaction frequency is about four a month (weekly), with optimized delivery volumes (truckload or half truckload). For now, data exchange on sales forecast is under test and, therefore, the information confidentiality and measurement of performance indicators are restricted to operational aspects.

The retailer also reports that, despite counting on stable prices (which favors collaboration), the following CPFR steps may result in high organizational changes, making their implementation difficult.

#### *PILOT "B" – MANUFACTURER*

The pilot "B" CPG industry has worldwide presence, with more than 800 products sold in the Brazilian market in different segments (such as personal and home care, cosmetics, food, etc). In Brazil, it has nine factories (four of them outsourced), nine DCs and a strategically located Hub (main DC), with annual revenues exceeding US\$ 1 billion. The hub concentrates slow moving SKUs to replenish the DCs and fast moving SKUs from the plants to clients (retailers and wholesalers). About 10% of the sales go directly from the plants to retailers and other clients.

Twenty items compose the CPFR pilot with the retail partner, which are approximately only 3% of total items mix sold to this particular client. The pilot items, which are not necessarily included among the promotional items (about 20% of the marketing mix), were selected to prioritize sales volume and economic margin relative to the other items.

The major hindrances are the negotiation power (industry is much bigger than the retailer) and lack of compromise of the retail partner concerning CPFR learning and training within their internal structure, which favors strict operational activities. In turn, the main benefits

are a better collaborative relationship with the partner, linearity of deliveries along the month (smaller end-month peaks) and increase in sales volume.

The implementation simultaneously engaged the first two steps, being the strategic alignment always revised as collaborative agreements were developed between parts. Although it does not count on a defined forecasting plan, as IT resources for data exchange are limited to EDI, the industry uses KPIs that support tactical and operational planning. In the second step, the industry and the partner are defining a routing plan, scheduling and delivery windows.

To the industry, the CPFR implementation cost (investment in IT and human resources) is high. Therefore, it has been impossible to implement it for all items, as the industry deals with a wide range of products and short horizons for delivering orders, and also demanding a well defined organizational structure.

#### *PILOT “B” – RETAILER*

For twenty years, the retailer (a family-owned, mid-sized business), with seven big stores strategically distributed in the largest Brazilian metropolitan center, has been intensifying trade agreements by means of collaborative relationship with the industry.

This collaborative relationship with the partner began some years ago by means of promotional actions and product category management; only six months ago the CPFR project effectively started.

According to those interviewed (owners), although CPFR implementation is considered important, the company structure and the low frequency of meetings with the partners (every three months) hinder its good development. Even so, the relationship and the strategic alignment have been useful to define some business rules and some visible results were attained, such as decrease in inventory and in out-of-stocks in display shelves.

#### **PRELIMINARY ANALYSIS OF CASES**

Concerning Pilot “A”, a better sales performance of promotional products led to good results from the application of collaboration initiatives and raised expectation on the application of the next CPFR steps. It can be observed that, although there are divergences among the partners concerning the organizational structure and planning focus, there is strong symmetry in the collaborative relationship, since the frequency in transactions and the confidentiality of information among the partners improves their reputation, which leads to a reduction in transaction costs. On the other hand, the high specificity of human assets raises transaction costs in the short term, because information is concentrated on a single person (on the retailers side) and on specialized personnel (in the industry case), making it necessary to frequently perform strategic/tactic realignment among the parties, in order not to lose focus on the collaboration process via CPFR.

Contrary to the industry, the retail market favors the operational focus instead of the strategic, maybe due to the immediate results generated by VMI and to the lack of an adequate organizational structure for CPFR internal development. In this sense, practice shows that the steps in the guidebook can be non-linearly applied, with the exception of the first, due to deficiencies of process formalization among remaining internal areas in the retail. On the other hand, the previous existence of VMI facilitated, at a strategic level, more daring collaboration initiatives, making retailers invest in IT and change their

organizational structure, which helped their introduction to the continuous process of technological innovation.

However, reduction in transaction costs is evident: better final demand forecast, reduction in stock costs, transport optimization, reduction in demand oscillations, reduction in out-of-stocks, better organization of logistic processes, among others.

Concerning Pilot B, the early state of CPFR implementation leads to timid results in data exchange and in the strategic alignment for an effective collaboration. The small interaction of the parties by means of meetings to define business rules may have hindered the development of the pilot.

Participants from both pilots agree that the CPFR implementation led to a sound improvement in the relationship among partners, reduction in stocks, reduction in logistic operations, increase in transactions frequency, among others. Nevertheless, the high cost in IT investment and changes in business processes has led partners to slow implementation and to reduce the scope of products for the pilot.

### **PRELIMINARY CONCLUSIONS**

It can be concluded that the CPFR application results in Brazil are still incipient and that the collaboration initiatives are focused on the tactic/operational planning of the logistic system, serving as an inductor for changes and incentives, mainly in the retail market, to the other CPFR (long-term) steps, resulting in growing investments in technological innovation. For this, CPFR has been strategically implemented by partners.

It is believed that, in the long run, collaboration will share the governance power among partners in the retail chain, since these will lead technological innovation, getting increasingly closer to the final consumer. The resources (high specificity of human assets) spent on strategic alignment may have been relevant to the good development of the collaborative process which, in the long run, may be useful to reduce transaction costs, increasing frequency, reducing opportunistic actions and resulting in less monitoring on transactions.

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