New forms of CPFR: Daily collaboration at store level

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CPFR (Collaborative Planning Forecasting and Replenishment) has emerged as the latest business practice aiming to ensure that there is always enough quantity to meet consumer demand, while maintaining optimum levels of stock across the supply chain. The essence of CPFR is about utilizing technology capabilities and information sharing to support trading partner interaction and collaboration in meeting consumer demand. While most CPFR applications to-date focus on the replenishment of non-regular line items at central warehouse level, other forms of collaboration broaden the scope of this implementation. The Process of Collaborative Store Ordering (PCSO™) has emerged as a new form of CPFR covering the daily replenishment of the full product range at store level. The application of PCSO™ in the Greek grocery environment has significant business result to demonstrate.

The essence of CPFR

The grocery retail sector suffers a huge loss of revenue each year due to the out-of-shelf problem. Loyal consumers that don't find the products they want to purchase in their local store would simply shop elsewhere while less-loyal ones would switch to another brand or type of product. In many cases, the consumer will forget about the impulse to buy the product and will not purchase it at all. Fierce competition in the industry means that this problem is a major concern for both retailers and suppliers, who have to ensure that their products are in the right place on the right time or risk losing out to the competition.

In the last years, CPFR (Collaborative Planning Forecasting and Replenishment) has emerged as the latest business practice aiming to ensure that there is always enough quantity to meet consumer demand, while maintaining optimum levels of stock across the supply chain. More specifically, CPFR operates as a set of business processes in which trading partners agree to mutual business objectives and measures, develop joint sales and operational plans and collaborate to generate and update sales forecasts and replenishment plans. The CPFR guidelines, published by the Voluntary Industry Commerce Standards (VICS) Association in 1998, attempt to facilitate the adoption of collaborative practices supported by information and knowledge sharing, all that CPFR is about.

Forecasting demand (and subsequently setting inventory levels) is difficult owing to the influence of promotions, changing demand patterns, and competitive pressures. The traditional answer to inventory problems has been to simply hold increased inventories. Holding high levels of anticipatory inventory may offer a way to avoid out-of-stocks, but it is a very expensive method of avoidance. As an alternative, many value-chain participants (i.e. the buyer-seller dyad) have determined that a better approach is to collaboratively work together to manage inventory. Co-operative planning between trading partners facilitates better matching of supply and demand. Rather than trying to independently project demand patterns, buyers and sellers share information in advance and work together to develop realistic, informed, and detailed estimates that can be used to guide business operations.

The following illustration gives an example of applying CPFR in practice: Utilizing principles of CPFR, a retailer and consumer goods firm (manufacturer) would work together to jointly create a single, combined promotion calendar in advance of the selling period. The retailer would also provide DC demands, point-of-sale (POS) data, longer-term promotional plans, prescribed inventory levels, etc. or a parts of this information for the consumer goods trading partner. Both firms would create sales and order forecasts. The retailer would then send the retail forecast to the manufacturer. A collaborative system could be used to compare that forecast to the manufacturer's own forecast. Discrepancies or exceptions would be identified and appropriate managers advised. Working together, the "team" would decide on one, i.e. collaborative, forecast extending across the supply chain.

While the above example captures the essence of CPFR – utilizing information sharing to support trading partner interaction and collaboration in meeting consumer demand – it limits the breadth of CPFR application. In the following we describe a different paradigm of applying the CPFR philosophy, referred to as **Process of Collaborative Store Ordering (PCSO™)**. Before doing so, we provide a framework classifying the various CPFR initiatives undertaken to date.

Understanding the various CPFR initiatives

The CPFR initiative aims to resolve the problems left by previous business practices (e.g. Continuous Replenishment, Vendor-Managed Inventory). Through CPFR, various issues are addressed:

- Holding high inventory levels to ensure product availability on the shelves
- Dependencies between the promotions and the creation of the sales forecast
- Dependencies between changing demand patterns and the creation of a sales forecast
- The issue of general synchronization in the suppliers departments.
- The multiple forecasts developed within (or not) the same organization

Since the birth of CPFR, various implementations have been reported focusing on one or more of these issues. All of these implementations seem to have followed the nine-step CPFR model developed by VICS. In general, many of the collaborating partners were able to apply the full model, while others have adjusted the model to the individual needs of their trading relationship. In terms of practical application, the various cases differ in the scope of the project, the breadth of implementation, the specific objectives set.

The implementation scope of a CPFR case could be seen across the following axes:

1. **Place**: Most of the cases focus on the replenishment of the *retail distribution center (DC)*, while others try to apply the CPFR principles at *store level*. In some cases, CPFR is applied up-stream in the value chain, focusing on the replenishment of the *manufacturer's DC*.
2. **Product**: This axis defines whether the CPFR project covered only products from non-regular lines (e.g. *seasonal* items, *promotional* items, *new* products), all the *products of* a *specific category*, or *all the products* supplied by a manufacturer.
3. **Time**: This axis refers to the time horizon of a sales/ or order forecast and the frequency of collaboration. Among the various cases, it is possible to find CPFR implementations on a *monthly*, *weekly* or *daily* base.
4. **Information sharing**: The last axis addresses the information shared among the collaborating partners for CPFR to be operational. Some projects rely just on the exchange of *internal forecasts* sent via fax, e-mail, over the web or other medium. Other projects go further to exchanging not only internal forecasts but also *POS data,* either on a daily or weekly basis. Other information, such as *stock* level, *promotion*

activities, *out-of-shelf indications* etc., may also be exchanged in a richer information environment.

Figure 1 depicts the placement of the various CPFR cases reported on the grid defined by these four axes.

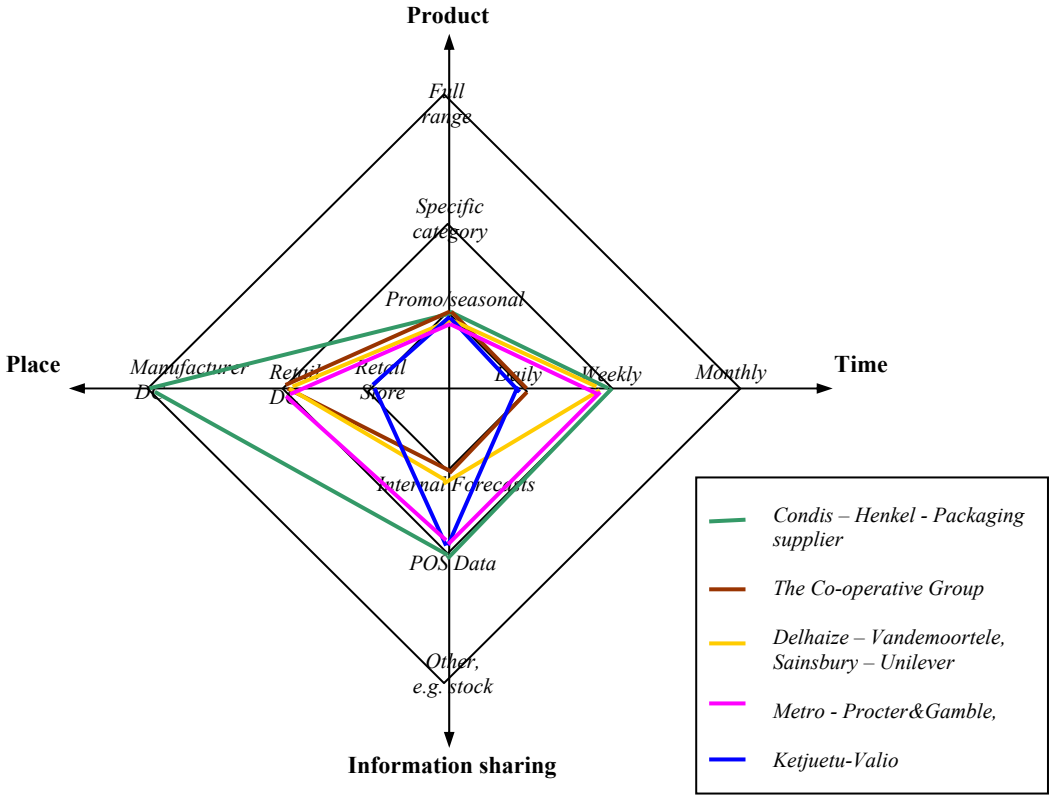


Figure 1: *Scope of implementation of the various CPFR initiatives*

The figure above clearly shows that the focus of the various CPFR projects reported to-date is around the replenishment of the retailer's distribution center. These projects deal with promotion items and new introductions, rather than regular line products, while the information shared is POS data (mainly electronically) and promotion plans. The sales and order forecasts go down to daily or weekly level. The case of Ketjuetu-Valio is the only one addressing the forecast accuracy at store level, aiming to effectively manage the replenishment process of promotional and seasonal items.

Collaborative Store Ordering: Daily CPFR at store level

All the cases mentioned above have reported the ability to effectively manage the replenishment process through more accurate forecasting. Specific benefits described include inventory reduction, reduced costs, more frequent deliveries, fewer stock-outs, more effective handling of promotional items. Being able to deliver these benefits to the end point-of-sales, the final interface with the consumer, is obviously the ultimate objective of all the partners in the supply chain. In the following, we describe a new form of CPFR aiming to bring the impact of these potential benefits down to store level, affecting not only promotion and special line items but the full product range.

The *Process of Collaborative Store Ordering (PCSO™),* as it is called, is about trading partners sharing information and collaborating on a daily basis in order to support the store replenishment process. This model brings together over the Web the expert opinion of the

product suppliers and the unique knowledge of the store managers with the ultimate objective to eliminate out-of-shelf situations, while maintaining optimum levels of stock throughout the supply chain. It is a new collaborative practice that supports the daily store-replenishment process, based on the online-sharing of critical information such as: sales data (POS), store assortments, stock-level in the store, promotion activities, out-of-shelf alerts, etc.

This process is supported by special IT infrastructure (collaborative platform) to enable the daily online sharing of all the critical information, the sales forecasting and order generation, the online collaboration of the trading partners, and finally the order exchange and status tracking. Any user connects to this collaborative platform through a secure Internet connection using a simple Web-browser interface.

The following description illustrates the practical aspects of this process in more detail. By connecting to the collaboration platform, a supplier can monitor per each store the product assortment, the product sell-out, the promotion activities, the level of stock etc. on a daily basis. Moreover, the supplier can view the system's proposed order quantities and make an order proposal to the respective store manager. He/she can also track the order status throughout the fulfilment cycle. All this information is available in dynamic (OLAP) online reports, allowing statistical analysis of those parameters down to store level. The store manager, on the retailer's side, has an overview of the full product assortment per category or supplier and can submit an order based on both the system's proposal and the supplier's proposed quantities as well as on the rest of the information on product sales, promotions, stock etc. The submitted order is automatically sent to the platform and then forwarded either directly to the supplier or to the retailer's central warehouse. Automatic order-generation tools are also in place to help both the salesman and the store manager identify the right products that need to be replenished on a daily basis.

Figure 2 positions PCSO™ on the 4-axes classification framework for CPFR initiatives presented above.

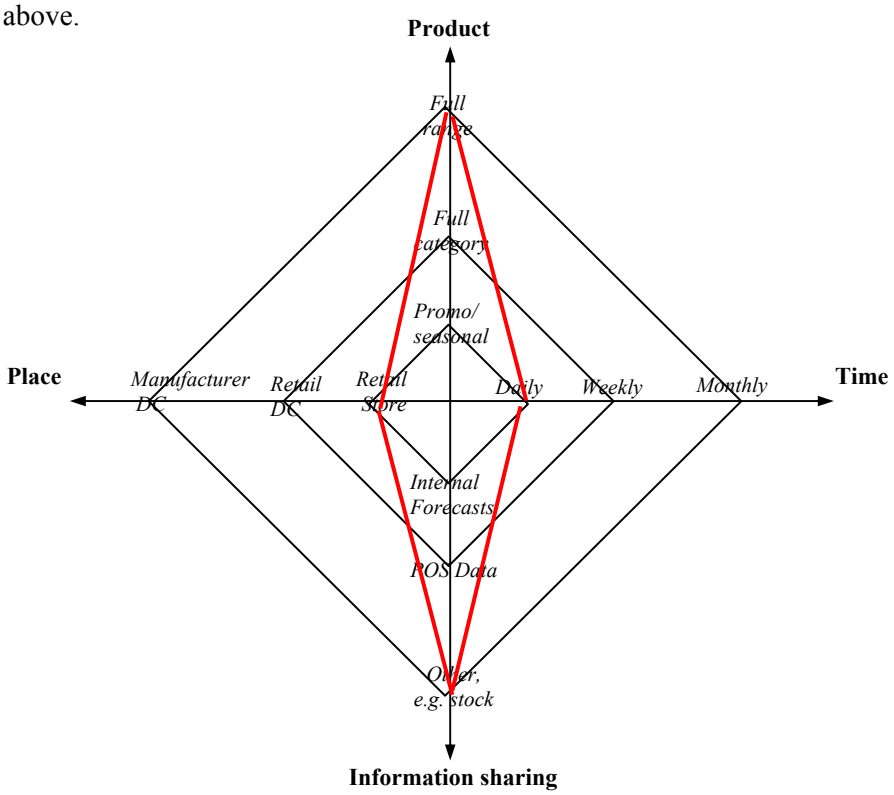


Figure 2: *The implementation scope of PCSO™*

The main characteristics that render PCSO™ unique compared to the other CPFR cases are summarized in the following points:

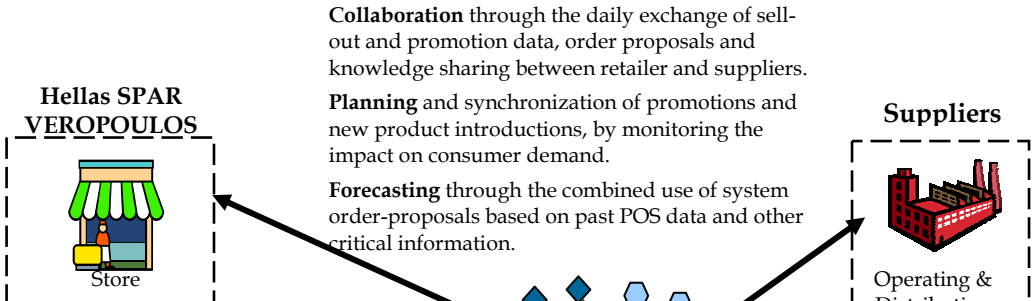
- *Store-level collaboration*: the specific CPFR practice focuses on collaboration at the store level, the critical interface between the consumer and the grocery supply chain. This is where most of the opportunities for improvement are regarding shortages on shelves, speed of entry, efficient promotions, etc.
- *Online sharing of the full store image on a daily basis*: retailer and supplier share all the information available for describing the situation in the store, from the specific store assortment, to sell-out data, stock levels in the store, information on promotions, out-of-shelf notifications. This information sharing takes place over the Internet on a daily basis, so that each morning all the partners have the full store image till the night before.
- *Full product range*: The effective sharing of information and the utilities of the specific IT infrastructure make it possible for the retailer and collaborating suppliers to use PCSO™ for the full product range in a store's assortment and not only focus on specific product items (e.g. new, seasonal, promotional etc.).
- *Many-to-many environment*: the intermediary collaboration platform gives each retailer and supplier the possibility to collaborate in a many-to-many environment with no additional effort and investment required to set this up.
- *Common communication platform*: what is important to mention is that the same environment used for information sharing, is also used as a common communication platform from the supplier offices down to the store. Specific roles assignment, work flows and information streams make it possible to effectively and efficiently communicate and direct the information to the ones and only those that need to see it.

PCSO™ does not focus on the forecasting aspect of CPFR, as the scope was from the beginning the collaborative replenishment at store level and on a daily basis. The best forecasting algorithm cannot render satisfying results under this scope, especially when there are innumerable number of parameters that may affect the daily demand for an SKU at store level. Thus, the focus from the beginning had deliberately been placed on making retailers and suppliers more *responsive* to ever-changing consumer demand, through timely and effective information sharing, rather than making them forecast this demand.

PCSO™ greatly improves shelf availability in the Greek Grocery Environment

The application of PCSO™ in Greece started in the form of a pilot between Hellas Spar Veropoulos, the 3rd largest grocery retail chain in Greece, and the three suppliers, the Greek company Elgeka S.A., Procter & Gamble Hellas and Unilever Hellas. The pilot implementation was facilitated by ONIA-NET S.A., the service provider for the PCSO™ collaborative platform in Greece.

The pilot, which went live on 1st October 2001, has rendered very positive results which made Veropoulos extend its application to the whole chain. By Sep 2002, more than half of Veropoulos stores use PCSO™ over the ONIA-NET platform in collaboration with suppliers. Results shown in Figure 4 below refer to the first evaluation phase of the pilot (from September to end of November 2001) and include total results for the four participants.



Overall, in the area of shelf availability, the results show an important decrease in the number of out-of-shelf situations both, before and after the pilot and between pilot and control stores. The out-of-shelf (OOS) situation in the stores before the four companies started collaborating under PCSO™ was that approximately 70% of the OOS were attributed to two main reasons: *wrong order quantity* and *no-order at all*. The OOS measurements that took place during the pilot confirmed the decrease in the OOS that are attributable to these two causes, as Figure 4 shows. Figure 4 compares the OOS per reason during the week before the pilot with the situation after six weeks of using the PCSO™ model in the pilot stores and as compared to the control stores. While the pilot stores managed to reduce the main reason causing an OOS, that is the "wrong order quantity", by 63%, the OOS owed to this reason in the control stores increased by 48%.

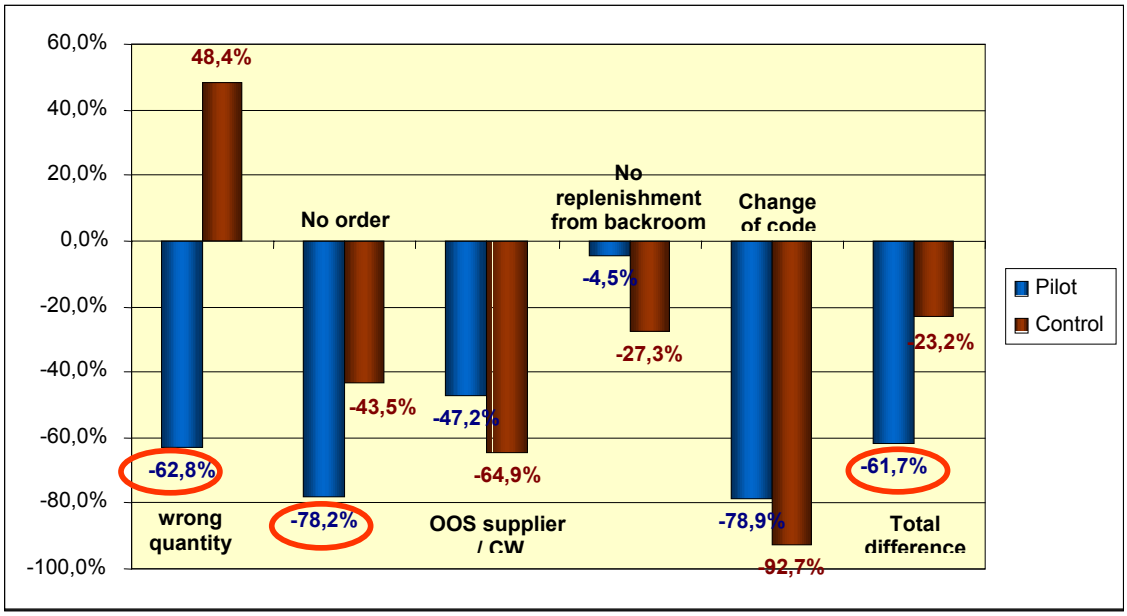


***Figure 4**: Comparison of out-of-shelves per reason before and after PCSO™*

At the same time that the shelf availability checks were performed, the four companies measured the respective stock levels in the stores. While the level of stock decreased after the application of PCSO™ in both groups of stores, pilot stores show a much bigger decrease (-8,7%) than control stores (-3,2%).

The repetition of the evaluation for direct store deliveries in March 2002, confirmed the first results of the evaluation, presenting a sustainable –53% difference in the out-of-shelf situations between pilot (4,3% OOS) and control stores (9,4% OOS).

Conclusions

Summarizing the comparison above between PCSO™ and the rest of CPFR initiatives as well as the learnings from the Greek pilot, we can conclude that the daily application of CPFR at store level can render significant business benefits, especially in the area of shelf availability. Apart from streamlining the supply-chain, through optimised stock-levels, better promotion planning and reduced time-efforts, it has a great potential to increase sales by significantly reducing the out-of-shelf situations.

While applying CPFR at the DC level has great benefits, as most CPFR pilots have demonstrated, bringing these benefits down to the store is where most of the opportunities lie. Research across Europe has shown that more than 70% of the out-of-shelf situations are ought to wrong handling or problems in the store. It is thus important for retailers and manufacturers to collaborate in order to better meet consumer demand at where it occurs –the store level.

On the other hand, being able to apply CPFR on the full product range of a retail chain, allows retailers collaborate with many manufacturers at the same time, giving them the opportunity to achieve the critical mass necessary for hard business results. Collaborating in a many-to-many environment is also important for manufacturers in order to achieve the critical mass of retailers necessary to improve the up-stream supply-chain with the ultimate goal of efficient production planning.

In any case, redesign of processes is necessary both at the level of the store, at the retailer central offices and in the supplier's organization if the full benefits of PCSO™ are to be exploited.

On the infrastructure side, it is important to have a clear product mapping and data validation mechanism to ensure reliable data and uninterrupted communication between partners. Without the existence of a collaborative platform supporting PCSO™, the daily collaboration to support the store replenishment for the full product range wouldn't have been possible.

References

1. Koloszyc, G. (1998) "*Retailers, suppliers push joint forecasting*", STORES vol. 80 no. 6, pp.28-31
2. Stank, T. Daughtery, P. Autry, C. (1999)"*Collaborative planning: supporting automatic replenishment programs*", Supply Chain Management, Vol.4 No.2, pp75-84
3. Holmstrom, J. Framling, K. Kaipia, R. and Saranen, J (2002) "*Collaborative planning forecasting and replenishment: new solutions needed for mass collaboration*", Supply Chain Management: An International Journal Vol 7. No 3. pp. 136-145
4. ECR Europe, "European CPFR Insights" (2002)
5. Barratt, M. and Oliveira, A. (2001) "*Exploring the experience of collaborative planning initiatives*", International Journal of Physical Distribution and Logistics Management, vol.31 no4, pp, 266-289.
6. Seifert, D. "Collaborative Planning Forecasting and Replenishment", (2002), Galileo Press