HELSINKI UNIVERSITY OF TECHNOLOGY
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COLLABORATIVE PLANNING, FORECASTING, AND REPLENISHMENT IN EUROPEAN GROCERY RETAIL

Seminar in Industrial Management
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ABSTRACT

This report is the documentation of a seminar study in industrial management done at Helsinki University of Technology. The client of the study was Netlog Project led by TAI Research center. The research problem and the scope of the study were set to address a particular need of the client.

The research problem was represented with questions: How has Collaborative, Planning, Forecasting, and Replenishment (CPFR) been implemented in Europe, where have the implementation projects led into, and what can be learned from them? The cases providing sufficiently information were selected, described, and analyzed. On the basis of the analyses, a suggested framework for CPFR implementation was provided.

The eight cases studied were implemented by Eroski and Henkel, Condis and Henkel, Metro and Procter & Gamble, Ketjuetu and Valio, Delhaize and Vandemoortele, Sainsbury's and Unilever, and within The Co-operative Group, and by a group consisting of Veropoulos, Elgeka, P&G Hellas, and Unilever.

The analyses provided the following findings: *Firstly*, the most tangible benefits from CPFR seemed to take more than a couple of pilot projects to be realized. *Secondly*, the companies favored forecasting at the distribution center level and used the Point-of-Sales data relatively rarely. *Thirdly*, the companies clearly understood the value of partnership and using shared forecasts but there were still problems in integrating the forecasts into their operations planning. *Fourthly*, some of the CPFR process steps appeared to be misunderstood, which resulted in CPFR processes that were in fact quite far from the original CPFR model.

On the basis of the above findings, a thesis in form of a CPFR implementation framework was developed. The framework emphasized five significant stages of the implementation. They are: Forming a sound basis for the collaboration, making sure that CPFR is understood, evaluating the approaches to collaboration, reassuring that forecasting is done at the right level and with the best possible data, and keeping the focus in the objectives that really matter.

Finally, it was suggested that case studies on American implementation projects or studies comparing different collaboration models would possibly provide interesting and valuable insights.

KEYWORDS: Collaborative Planning Forecasting and Replenishment, CPFR, collaboration, co-operation, planning, forecasting, supply chain management, grocery retail.

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1 INTRODUCTION

1.1 Background

In business the trends and applications vary among time and the industry considered. Nonetheless, some fundamentals seem to prevail from time to time. Currently one of them is the realization of a need for supply chain integration. It has been understood that the prosperity of a business is always really driven by the satisfaction of chain's end-customer. Thus, striving for one's own profitability is no longer sufficient. Instead, collaboration and integration is required to serve the customers cost efficiently through lean and agile supply chains[1].

The customer's satisfaction can be seen as a result of weighing product's perceived quality, price, and functionality against customer's assumptions of them[2]. However, in order to get that far, it is obvious that first the product has to be available to the customer. Maintaining availability at a certain level knowingly requires a fluently managed supply of products[3]. Also, it has been realized that the demand of products is not just a given condition either but a variable that is manageable too[4]. Thus, guaranteeing availability requires the coordination of both: the supply and the demand of products.

The criticality of availability depends on the industry. Especially crucial it is in the grocery retail and the consumer goods industry, where the uniformity and substitutability of goods inflict that stock-outs lead directly into lost sales. Furthermore, the lost customer goodwill can make the damage permanent. Thus, it is not surprising that a customer service focused concept in integrating the supply and demand management has emerged within the retail industry in particular. The concept is known as the *Efficient Consumer Response* (ECR) [5].

ECR aims to address a wide variety of challenges. One topic among many others is the management of the supplier-distributor collaboration in the product replenishment. One solution to this particular task is called the *Collaborative Planning, Forecasting, and Replenishment* (CPFR) process.

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1 e.g. Waters, 2003. p. 34
2 e.g. Lambert et al, 1998. p.12-14
3 e.g. Bowersox & Closs, 1996. p.66-75
4 e.g. Vollmann et al, 1997. p.312-345
5 e.g. Kurt Salmon Associates Inc, 1993. p.1

The CPFR process model is relatively new and its initial results in North America have been promising[6]. Nevertheless, its adoption in Europe has been slower than expected[7], which makes it an especially interesting research topic. Thus, also the Netlog project led by TAI Research Center at Helsinki University of Technology has recognized a need to know more about the model. This study has been done to in part fill that particular need.

1.2 Research Problem and Objectives

As the client of the study was the Netlog project, the research problem was tailored accordingly. The Netlog researchers had found out that objective documentation of CPFR implementation projects is not easily available. Some success stories have been published here and there but structured analyses on what have been actually done and how it has worked are still rare. This fact formed the grounds for the research problem that was:

How has CPFR been implemented in Europe, where have the implementation projects led into, and what can be learned from them?

Thus the objectives of the study were as follows:

- To find out what have been published on the European CPFR implementation projects.
- To analyze the project cases congruently.
- To summarize the key characteristics of the projects.
- To form conclusions based on the analyses and the summaries.

1.3 Scope of Study

As the objectives indicate, the most obvious constriction to the study was a geographical one. Two reasons justified the focusing in Europe. *Firstly*, it is Finland's home market as more than 80 percent of our trade volume is generated within the continent[8]. *Secondly*, the European and North American

[6] Seifert, 2002. p.105
[7] Småros, 2003. p.2
[8] Statistics Finland, 2002. p.258

retail industries are distinctively different from each other[9], which makes this kind of segmentation reasonable.

As the title of the study suggests, the other limitation was staying within the grocery retail. This was because all of the available material considered the grocery industry in particular.

1.4 Research Method

The client's need dictated the research method also. The recognized problem was that the CPFR project reports are usually done by consultancies and therefore can be subjective or covered with over-optimism. In order to filter out the hype a *cross-case pattern search method* was used. The idea in it is to force the investigator to look beyond the initial impressions by applying the same pre-structured analysis format to every case[10].

In general, the research process and its reporting followed a case study methodology set by Kathleen Eisenhardt. The key points of the study process and the analogy with Eisenhardt's methodology are presented in the figure 1.

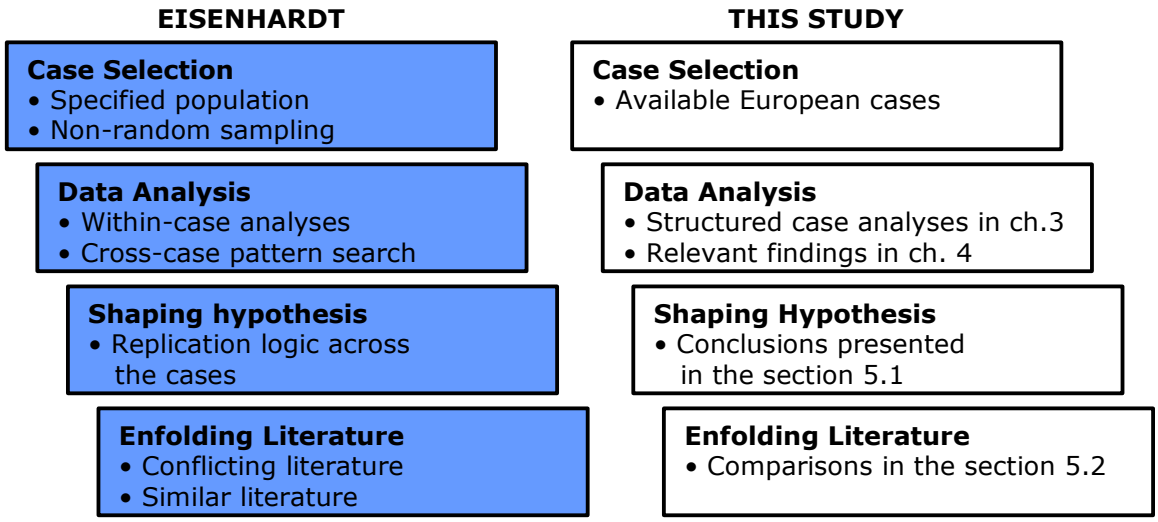

Figure 1. Research Method [11]

[9] e.g. Seifert, 2002. p.146-147 or Doiron, 2003. (presentation)
[10] Eisenhardt, 1989. p.540-541
[11] ibid. p.533

2 BASIC CONCEPTS

Before introducing the actual cases it is necessary to clarify the basic concepts, terminology, and reasoning behind CPFR. *First*, an overlook into the ECR concept is provided aiming to give understanding about the context wherein CPFR plays its part. *After that*, CPFR itself is defined and its principles explained. *Then* the CPFR process model is broken into steps and described. *Finally in the end of the chapter*, model's possible benefits are listed and a few guidelines for implementation given.

2.1 ECR as Origin of CPFR

By its definition the *Efficient Consumer Response* (ECR) stands for a situation where all supply chain members are "working together to fulfill the consumer wishes better, faster and at less cost."[12] This is without a doubt an ambitious objective. Thus the means to achieve this kind of co-operation are not only numerous but also continuously evolving. Next, these means are described briefly. The figure presented below, and its explanation, are the ones used by Global Commerce Initiative (GCI), which is an international collaboration body committed to promoting and sharing best business practices[13].

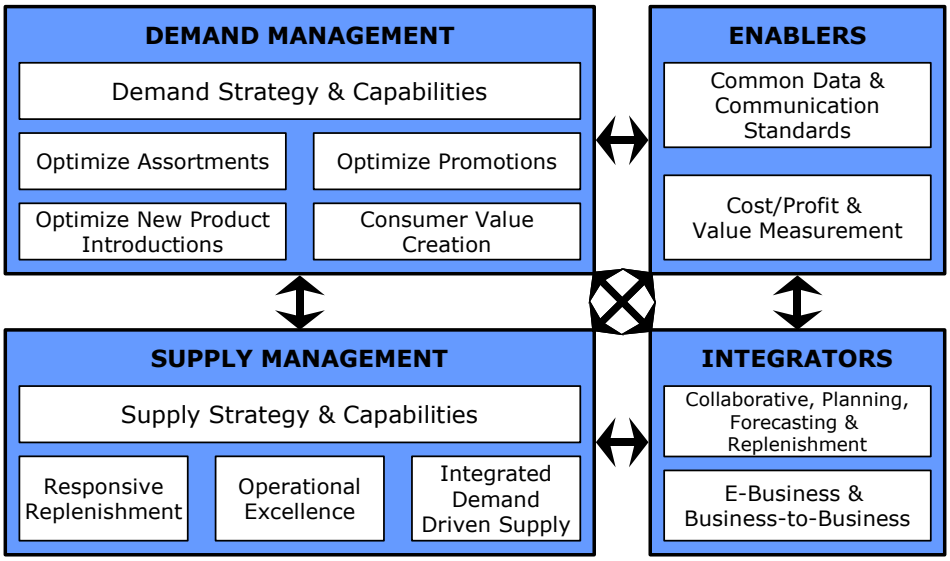

Figure 2. ECR Scorecard [14]

[12] ECR Europe home site. URL: http://www.ecrnet.org
[13] GCI home site. URL: http://www.gci-net.org
[14] Global ECR Scorecard. URL: http://www.globalscorecard.net/index.asp

Demand Management

The upper half of the figure is also often known as *category management* (CM) or as the *marketing* part of ECR. It covers the supply chain collaboration in the following fields:

- *Assortment optimization*, which is planning and organizing the product assortments to meet the needs of the target customers.
- *Promotions optimization*, which means the collaboration in the planning and the execution of promotions so that they are consistent with both parties' corporate objectives and category strategies.
- *New product introduction (NPI) optimization* is the collaboration in ensuring both the strategic consistency and the availability of products at the launch date.
- *Consumer value creation* is collaboration in customer relationship management. It includes issues like sharing and leveraging the customer knowledge, seeking alliances beyond product and channel boundaries, and continuously seeking new ways of fulfilling the customer needs.

Supply Management

The lower half of the figure can be also known as *Supply Chain Management* (SCM) or as the *logistics* side of ECR. It covers the supply chain collaboration in the following fields:

- *Responsive replenishment* denoting the efficient management of information and material flows. Tools for the information side include automated store ordering and *Continuous Replenishment* (CR) driven by *Electronic Point-of-Sale* (EPOS) data. The issues for the material side consider for instance transportation pooling and cross docking aimed to optimize the transport utilization and to enable efficient order quantities.
- *Operational excellence*, which is continuous improvement towards more effective production, more efficient distribution, and more reliable store operation. For example quality management issues play a large role on this field.
- *Integrated demand driven supply* meaning that not only the replenishment but also manufacturers' procurement is synchronized with the actual consumer demand. Practices that facilitate this include supplier

consolidation and *Vendor Managed Inventory* (VMI).

Enablers and Integrators

The enablers and the integrators of the figure are developed to facilitate both the above-presented individual tasks and the balanced coordination of supply and demand management. These tools and practices are understandably numerous and are not to be described in detail here. To name a few, they include information technology solutions like *Electronic Data Interchange* (EDI), e-procurement, *Electronic Fund Transfer* (EFT), and formal decision evaluation tools like *Activity-Based Costing* (ABC).

However, these tools and practices only make the collaboration in planning possible. They do not make the collaboration happen. This is where CPFR steps in. Its function is, while being uncommitted to the technical solutions, to describe the process that enables the jointly managed planning and sharing of information among the organizations of people.

2.2 Definition and Principles of CPFR

CPFR is defined as "*an initiative among all participants in the supply chain intended to improve the relationship among them through jointly managed planning processes and shared information*"[15]. Three principles and a formal process model guide this initiative. The principles are[16]:

- *A trading partner framework is established between the participants.* The framework is unique to the case and takes into account the competences of the participants. The framework shares responsibilities and leadership of the core CPFR process activities according to participants' backgrounds, competences, and offerings.
- *Participants agree that in CPFR they share one and only one operational forecast of demand.* In the CPFR process the participants agree on what information sharing technologies and forecasting techniques they will use, and also how they will resolve their possibly differing views on the forecast. However, the end result is only one forecast that will steer the planning.

[15] Seifert, 2002. p.41
[16] VICS, 2002. p.2

- *Participants commit into the removal of the supply-process constraints.* The value of a single forecast is to integrate the planning process. This is valuable for it will point out the potential savings in the total supply chain costs. For example manufacturers outbound buffer inventory can be reduced if forecasts are synchronized with the production cycle time. Without CPFR, retailers' forecasts and ordering cycles are usually considerably shorter and thus create the need for buffering stocks.

Before presenting the actual process model it might be useful to stress a bit for what all the above and the model that follows are actually all about. Lawrence Fennell, from the CPFR-pioneer Wal-Mart, have used the following arguments[17]:

- It's not about technology or software – it's a business strategy to establish collaboration with mutually agreed objectives.
- It's not a new business paradigm – it's a cultural change where the pace and the metrics of performance are agreed between the partners.
- It's not about adding staff – it's about repositioning structures to match the CPFR strategy.
- It's not about summit meetings, power point presentations, or video conferencing – it's about real time communication and collaboration in responding the dynamics of the consumer-based, real, demand.

2.3 CPFR Process Model

The *Voluntary Inter-industry Commerce Standards* (VICS) association has developed a formal process model to enable the execution of the above principles. The model was made in 1998 as a generalization of a collaboration initiative between Wal-Mart, Warner-Lambert, SAP, Manugistics, and Benchmark Partners[18]. It is now presented in its full form in the figure 3.

[17] Seifert, 2002. p.130-132
[18] Barratt & Oliveira, 2001. p.269

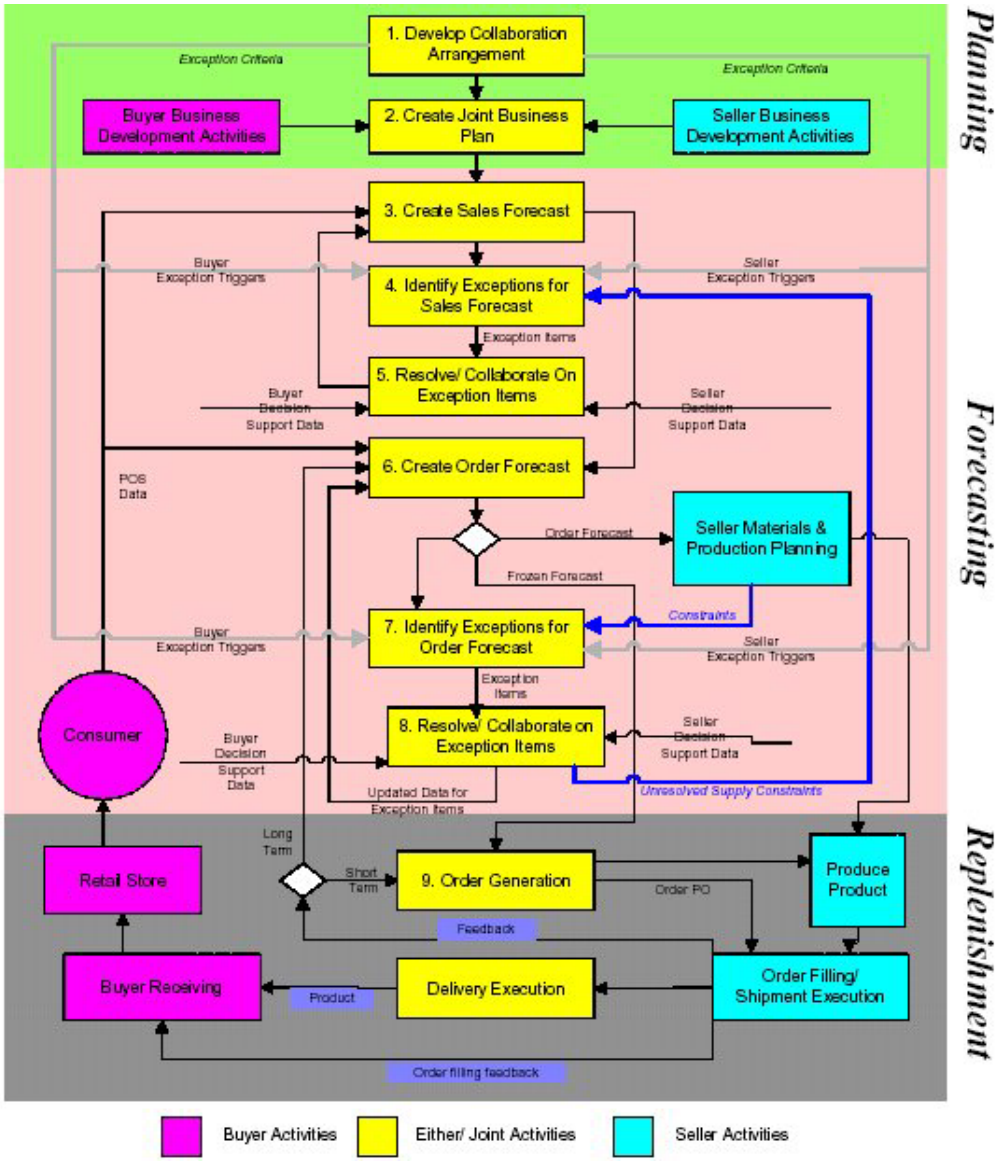

Figure 3. CPFR Process Model [19]

The CPFR process is divided into three consecutive phases: *planning*, *forecasting*, and *replenishment*. The process activities divide into three groups also. The divider here is the ownership. Each activity can be owned by the buyer or by the seller or they can be managed jointly. The last kind of activities can also be allocated to either participant through the partnership framework discussed earlier. These joint or allocated activities form nine steps that are the backbone of the process.

Above the participants are called *buyers* and *sellers* because the model is not dependent on which part of the supply chain it is used. Thus, the buyer can be a

[19] VICS, 2002. p.4

retailer, retailer's distribution center, or a manufacturer. The seller again can be manufacturer's supplier, the manufacturer itself, or manufacturer's distribution center.

The following description of the process steps represents the guidelines used by VICS.[20]

Step 1: Develop Collaboration Agreement

The planning phase, that is the first two steps, form the foundation of the process. Here the participants agree on the rules, on which the whole iterative forecasting-replenishment process will be based.

The first thing to do in CPFR is to establish a front-end agreement on the rules, and conventions of the partnership framework. The issues requiring consideration are:

- *Formation of the CPFR mission statement* ensures both sides' commitment into cooperation, trust, and availability of resources.
- *Determination of the objectives and practicalities* sets the concrete goals and determines the criteria for exceptions in the forecasts. These exceptions will be very important issues later in the process. They exist because some items, like seasonal or promotional products, cannot be automatically forecasted with regular methods and techniques.[21]
- *Creation of mutual understanding of both participant's systems and competences* enables the possible ownership allocation of joint activities.
- *Definition of collaboration points and responsible business functions* determines the executing functions in both organizations.
- *Establishment of resource commitment* names the responsible people that are devoted to CPFR within both organizations.
- *Conceptualization of information sharing needs* identifies the medium and frequency of information exchange as well as the allowable response times and the forecasting methods to be used.
- *Definition of service and ordering commitments* will be especially

[20] VICS, 2002. p.4-20

[21] The forecasting techniques are clearly out of the scope of this study. However, quality material covering the issue is provided in NIST/SEMATECH e-Handbook of Statistical Methods. URL: http://www.itl.nist.gov/div898/handbook/, see chapter 6.4

important later at the point where collaboratively determined projections become firm orders.

- *Formation of resolution rules for disagreements* will become invaluable at some point of the future collaboration.
- *Establishment of continual evaluation and development cycles for the process* sets the basis on which the process will be regenerated.
- *Published front-end agreement* binds the participants formally to the process.

Step 2: Create Joint Business Plan

To form a joint business plan the participants need to share information about their own strategies and plans. The objective is to synchronize the views so that common *category strategies*, *promotional plans*, and *item management profiles* could be set for a specified period. Agreeing on category strategies means clarifying the roles and objectives of the product categories that are managed with CPFR. The promotional plans again relate to the pricing actions, and to the scale, location, and schedule of promotional events. Finally, the item management profiles are product-wise terms like minimum orders, order intervals, and lead times.

Step 3: Create Sales Forecast

The actual iterative process starts from the sales forecast. Although the forecasting techniques are not within the scope of this study, a few points need to be emphasized. *Firstly,* as it was already once mentioned, the forecast horizon needs to be synchronized with the manufacturer's cycle time. *Secondly*, the step should begin with both participants generating their own forecasts. *Thirdly*, an agreed upon method of weighing each forecast is to be used in the generation of the final shared forecast. *Fourthly*, the forecasts should be done at the store level and to each *Stock-Keeping Unit* (SKU). This means that manufacturers should increase the detail from their normally preferred aggregated forecasts.[22]

Step 4: Identify Exceptions for Sales Forecast

As the figure 3 shows, the "unexceptional" forecasts are "automatically" converted into shared forecasts and passed straight to the step six. However,

[22] Seifert, 2002. p.64-65

during the step one the participants have agreed on certain conditions, in which the forecasts require further consideration. This consideration takes place when an exception criterion is fulfilled. The criteria can be triggered by exceeding for instance a certain tolerance between participants' forecasts or a level in a certain ratio like inventory fill-rate. Triggering of an exception is probably a symptom of an error or an unexpected event. Thus, using the regular conversion into a shared forecast could pass the error forward. To prevent this, the exception has to be investigated in collaboration.

Step 5: Resolve and Collaborate on Exception Items

Usually resolving an exception starts from both parties trying to investigate the forecasts for obvious errors. If there are none, a person-to-person real-time communication is required. Through this collaboration the causes for the exception (f. ex. issues with data integrity, changes in advertising plans, or just differing strategic views[23]) should be identified. Also, through the personal collaboration a compromise over the differing views should be found and a shared forecast generated accordingly.

Step 6: Create Order Forecast

After the shared forecasts on sales are agreed upon, they can be converted into order forecasts. In practice the order forecast is a replenishment plan that satisfies the forecasted demand. Thus, the conversion is done through reducing the current inventories and scheduled receipts from the sales forecast. At this point it is also necessary to consider the minimum lot sizes, delivery times, and other terms agreed in the joint business plan (step two). Furthermore, logistical issues, like possible pooling of transportation, make this step too a complicated one to be handled straightforwardly or automatically. However, the rules regarding this conversion procedure are set in the front-end agreement (step one).

Step 7: Identify Exceptions for Order Forecast

After generating the forecasted orders, it is time to look for surprises again. This time an exception can be triggered if for example a planned order would exceed manufacturer's capacity to supply.

[23] Katz & Hannah, 2000. p.79

Step 8: Resolve and Collaborate on Exception Items

Likewise within the step five the exceptions are resolved through collaboration. A solution where all constraints are taken into account, and which minimizes the total supply chain costs, should be negotiated. After the resolution, the order forecasts are regenerated accordingly.

Step 9: Order Generation

The final step, and the replenishment phase of the process, takes place when the order forecasts have passed their exception criteria. Here they are converted into firm orders and passed to the other parts of both organizations.

2.4 Anticipated Benefits of CPFR

While the above process description may seem complex at the first sight, the reader should understand that eventually the partners should reach a state where the process in its most parts iterates efficiently through the steps three, six and nine only. Then also the encountered exceptions would be handled routinely through jointly adopted procedures. Once CPFR is running at this state, the process should start yielding its benefits. ECR Europe reports that CPFR can benefit in the following ways[24]:

- The single shared forecast combines the information of participants and thus increases shared knowledge and forecast accuracy.
- The increased collaboration improves the overall relationship between the partners and possibly opens new opportunities in cooperation.
- More efficient forecast-to-order conversion and replenishment procedure reduce stock-outs and delivery times thus increasing the responsiveness to the consumer demand and customer satisfaction, which both are likely to lead into increased sales.
- Increased forecast accuracy reduces the need for buffer inventories and also enables higher capacity utilization as the production planning is based on more reliable data.
- Aligning forecast and production planning horizons can also lead into shorter set-up times, and reduced handlings and administration.

[24] Accenture, 2001. p.21-22

2.5 Implementation of CPFR

VICS has tried to make the adoption for CPFR easier by providing an implementation roadmap. According to it the key to the implementation is to advance through pilot projects. They should be carried through with only one trading partner at a time. The recommended scope of the first project is one product category that covers ten to 50 SKUs. The roadmap allows other kinds of shortcutting too. For example: process steps can be reduced from the original nine to the first five only.[25]

Partial implementation through piloting makes the CPFR adoption more manageable. Advancing a bit by bit increases the chances for success and the learning possibilities during the implementation. After a successful pilot project, an expansion should be considered. Again a stepwise approach is recommended. VICS recommends the following directions for expansion after a successful CPFR pilot project[26]:

- Integrating the results, which means ensuring that the forecasts are actually used in operations planning etc.
- Expanding the pilot process to include more process steps.
- Adding the amount of SKUs to be managed through CPFR.
- Automating and streamlining of the process.
- Adding more trading partners to CPFR.
- Increasing the level of detail in the forecasts (f. ex. from aggregate to store level).

[25] VICS, 1999. p.14
[26] ibid. p.24

3 CASE ANALYSES

This chapter describes the European CPFR cases that were available to the author. Following the research method presented earlier, the descriptions are structured uniformly. Therefore the information from these analyses will be comparable in the cross-case analysis discussed in the next chapter.

The following analyses aim to answer the research question covering its first two parts, explicitly: *how the implementations were done* and *where have they led into*. The answer for *the first part* is sought with the questions:

- How many actors participated into the implementation and which part of the supply chain they were from?
- What were the number and the type of the S*tock-Keeping Units* (SKUs) in the pilot?
- Was the pilot run with store level or aggregated forecasts? What were the forecast horizon and the regeneration interval? And was Point-of-Sales (POS) data used?
- Which CPFR process steps the pilot project covered?
- How was the responsibility divided between the parties?

For *the second part*, the pre-structured format was no more applicable because of the vagueness of the published results. Thus, only objective and critical judgment was used to highlight the most convincing results.

3.1 Eroski – Henkel [27] [28]

German Henkel is a manufacturer of consumer goods with international brands like Schwarzkopf and Persil. Henkel has been one of the CPFR pioneers in Europe. In October 1999 it stared its first five-month pilot in Spain with Eroski. The latter is Spain's largest retail chain.

Reported Scope

- The pilot was run only at the central warehouses of both parties.
- The project covered all Henkel detergent products. The actual number of

[27] Jouenne, 2000. p.1-7
[28] Seifert, 2000. p.177-180

SKUs was not published. However, the focus was to enhance the availability of the promotional products especially.

- The forecasts were aggregated up to the national level. Sales forecasts were generated twice a week and order forecasts every week. The forecast horizon was kept in five weeks in order to match Henkel's production planning schedule. Only warehouse-level transactions were considered and the POS data was not used.
- Reportedly all steps of the CPFR process were implemented.
- At least the forecasting was solely on the Henkel's responsibility. Otherwise also, Eroski's role in all the activities seemed to have been a rather passive one.

Reported Results

- The only calculable reported result was the enhanced forecast accuracy.
- However, the parties listed several other benefits like: enhanced on-shelf availability, reduced stock-outs, reduced inventory levels and easier operations planning on the Henkel's side due to the lengthened forecasting and ordering horizons.
- According to the parties all this increased the sales of pilot products considerably.

3.2 Condis – Henkel [29] [30]

Henkel's second CPFR pilot was run with a Catalonian retailer Condis during the year 2000. This project included also partners from the upstream of the supply chain, namely Henkel's packaging suppliers such as Cartisa, Suñer and Reverplas.

Reported Scope

- In addition to Henkel's Spanish central warehouse this project included two *distribution centers* (DC) of Condis, and an undefined number of packaging suppliers.
- The number of SKUs was not published but the focus was entirely on the

[29] Accenture, 2001. p.73-76
[30] Accenture, 2002. p.24-29

promotional items in one category: detergents.

- The forecasts were aggregated at the DC level. The forecast horizon was as long as eight weeks in order to provide useable information to the suppliers too. The promotional planning was frozen up to two months before the events. The forecast interval was reportedly as ambitious as daily. Seemingly POS data was not used.
- Again it was told that all nine steps were implemented.
- Also again, Henkel seemingly carried the responsibility of the pilot and the whole process. At least "in the beginning" the forecasting was only done by Henkel.

Reported Results

- The sales forecast accuracy was improved from 60 to 75 percent.
- The DC service level (i.e. availability) was improved 1,5 percentage points to 99,5 percent.
- On-time deliveries were improved by 6 percent.
- Modifications to the promotional plan were reduced from 68 percent to 25.
- Upstream collaboration enhanced the operations planning and inventory management at Henkel and its suppliers
- The participants found the results satisfactory. During the project they had identified new directions for further development and were looking forward to expand the collaboration.

3.3 Metro – Procter & Gamble [31] [32]

Metro AG is Germany's largest retailer and Procter & Gamble is one of the leading international consumer goods manufacturers. Their CPFR pilot was launched in the summer of 2001.

Reported Scope

- The pilot project covered 53 Metro outlets and a Metro DC in Germany as well as apparently a P&G facility of an undefined kind.
- The pilot started with 53 SKUs and was afterwards extended to cover 130

[31] Accenture, 2002. p.44-47
[32] Seifert, 2002. p.206

SKUs. The focus was on promotional items.

- The sales forecasts for an eight-week timeframe were done on the weekly basis. These were apparently aggregated to the DC level. However, the POS data was also collected during the promotions.
- The process steps three to six (from the sales forecasting and solving its exceptions to the order forecasting) were used.
- Both parties generated forecasts, which were then converted into a shared one.

Reported Results

- The pilot was not finished at the time of the report's publication. Thus, there were no hard results available at all.
- However, the participants confronted at least the following challenges: inadequate communication in planning, insufficiently defined business processes, vaguely defined responsibilities, differing views of evaluation criteria, problems with insufficient, inexact, or outdated information.

3.4 Ketjuetu - Valio [33] [34] [35]

Ketjuetu is a Finnish central retail operations center for Tradeka Ltd. Before its merger with HOK, Elanto Co-op used to participate in it too. Valio again is the leading dairy products manufacturer in Finland. The pilot between these parties was started in September 2001 and results were collected during the last two months of the corresponding year.

Reported Scope

- The project included 10 Ketjuetu supermarkets (Siwa, Valintatalo, and Maxi) of different sizes and Valio's DCs.
- 18 SKUs were taken along. They represented standard, promotional, and seasonal items as well as *new product introductions* (NPI).
- Both store level and aggregated channel levels were used in the forecasts. Sales forecasts were done weekly and replenishments daily. The forecast horizon was not discussed in the reports. Data was captured from the

[33] Accenture, 2002. p.38-43
[34] Hyytinen & Toivonen, 2002. (presentation)
[35] Kärnä & Koski, 2003. (presentation)

POS.

- Reportedly the pilot project included all the nine steps of CPFR but it seemed that the focus was on the first five.
- Both parties' forecasts were used to generate the shared sales forecasts. Thus, the responsibility seemed to be relatively equally divided for the most important parts of the project. However, steps from six onwards were probably allocated to Valio.

Reported Results

- The main objective was to enhance the forecast accuracy. The reported results were meager but included notions like: "within standard items, there was no significant improvement" and "forecasting NPIs was considered very challenging and demands even greater collaboration".
- At the store level the units shipped in exceeded the demand and in-store logistics had problems in handling the receipt and storage of goods.
- Some other unmeasured but mentioned benefits were increased in-shelf availability, simplified work of the outlet employees, and "the common view of the customer" that was established.
- The parties considered CPFR as "a workable process for joint business operations" and as potential device for improving partnership.

3.5 Delhaize – Vandemoortele [36] [37]

Delhaize is an international retailer operating in Europe, USA, and Asia. Vandemoortele is a Belgian butter focused dairy product manufacturer. They have run two rounds of pilot projects - the first started in December 2000 and the second in January 2002.

Reported Scope

- The number of involved outlets or DCs was not documented.
- The number of SKUs was not reported either but the focus was on seasonal and promotional items and NPIs
- Forecasts were apparently on an aggregated level. They were done weekly

[36] Accenture, 2001. p.79-80
[37] Accenture, 2002. p.34-37

and the replenishment daily. The forecast horizon was 63 days. The POS data was not used.

- Reportedly the implemented process included all nine steps.
- Apparently the responsibility of the process was jointly carried.

Reported Results

- Sales forecast accuracy was "significantly" improved.
- The collaboration was considered "highly valuable for promotional items but no value-added could be identified for regular items".
- The service levels (i.e. availability) in the warehouses "remained" above 99 percent.
- The in-store on-shelf availability did not improve.
- The order forecasts were not used due to the logistics constraints.
- The following lesson was reported: CPFR needs to be used in operations management and planning rather than simply in creating forecasts.

3.6 Sainsbury's – Unilever [38] [39]

J. Sainsbury PLC is one of the world's leading retailers. Unilever is a multinational manufacturer of food, chemicals, and personal care products. These parties ran a pilot of 16 weeks in 2001.

Reported Scope

- The amount of outlets or DCs was not reported. However, it seemed that the CPFR process was applied between manufacturer and retailer DCs.
- 24 SKUs were considered. The focus was in promotional items and NPIs.
- The forecasts were not on the store level but aggregated to some unreported point, probably to the DC level. The forecasts of four to six weeks were generated weekly and the POS data was not used.
- The piloting CPFR included steps one and two, and six to nine, as the plain sales forecasting was not done at all.
- The responsibility of the process seemed to have been equally shared.

[38] Accenture, 2001. p.71-73
[39] Accenture, 2002. p.47-51

Reported Results

- The collaboration improved timing and phasing of promotions as well as timing, phasing, and accuracy of volumes for NPIs.
- Greater visibility seemingly improved the inventory management effort.
- In two cases a stock-out was prevented because of the CPFR process in particular.
- While the collaboration enhanced special event and NPI management, the key finding seemed to be that CPFR offers little for every-day business.

3.7 The Co-operative Group [40]

The Co-operative Group (CWS) is a joint formation of British co-op businesses engaged in wide variety of activities. During the past five years the wholesalers and the retailers within the group have together carried through numerous projects with CPFR-like characteristics.

Reported Scope (all projects)

- The CPFR-like projects at CWS covered eight regional DCs, 11 manufacturers, and 50 suppliers.
- Ca. 6100 SKUs were managed through collaboration. All kinds of items included to this number.
- The forecasts were aggregated to the regional DC level. The forecasts were generated daily but apparently without the POS data. The forecast horizons were not discussed, probably because of the variety of ongoing CPFR-like applications.
- This collaboration concept of CWS did not even try to follow the CPFR process. It seemed that the similarities with CPFR could be found in collaboratively generated orders and in the use of a single forecast, which was done together with the same software. Thus, the corresponding steps would have been three and nine.
- The internal nature of CWS's model made the responsibilities harder to identify.

[40] Accenture, 2002. p.29-34

Reported Results (all projects)

- The CWS recognized a 3 to 4 percent improvement in on-shelf availability at the store level.
- According to CWS the benefits also included the enhanced communications, better understanding of the market place, improved status, and a rise in productivity through the removal of unnecessary administrative functions.
- According to the reports, CWS was convinced of the above benefits and looked forward to further enhance the collaboration within itself and with its suppliers as well.

3.8 Veropoulos – Elgeka – P&G Hellas – Unilever [41]

Hellas Spar Veropoulos is the third largest retail chain in Greece. On the basis of an e-commerce platform it started a CPFR-like project with three of its suppliers (i.e. manufacturers in the CPFR sense): Procter & Gamble Hellas, Unilever Hellas, and Elgeka S.A., which is a local representative for various international consumer products. The pilot was launched in September 2001 and only its initial results were published.

Reported Scope

- The pilot included five retail outlets with varying sizes. Five other outlets were used to give control information from the traditional "un-collaborative" operations. The number of manufacturers' facilities was not reported.
- The initial phase of the project covered a total of 120 SKUs from the three manufacturers. However, the focus was said to be on the promotional items and NPIs.
- The store level forecasts were generated through the use of the POS data. The forecast horizons or interval times were not discussed in the report.
- The project did not follow the CPFR steps but many similarities with CPFR could be found. Most importantly a single shared forecast was generated, it was automatically converted into order forecast, which was then

[41] Accenture, 2002. p.51-59

corrected by the manufacturers and then confirmed as an order. Thus, in theory the steps three and six to nine were covered.

- The report obviously suggested that at least Veropoulos group and maybe also P&G Hellas had been the initiating and the most active participants of this project. However, clear conclusions about responsibilities could not be drawn.

Reported Results

- The pilot had two major impacts. *Firstly*, the stock-outs at store level were reduced up to 61,7 percent.
- *Secondly*, the in-store inventory levels were reduced by 8,7 percent.
- It was also reported that the benefits were larger to the manufacturers performing direct store deliveries rather than deliveries through centralized DCs.
- The reported benefits were unusually well supported and measured. Thus they are the most convincing among the studied case and it is not a surprise that the pilot was about be expanded and developed further.

3.9 Leads for Other Cases

Reports of other CPFR projects than the above can be found as well. However, at least the ones available to the author did not cover enough information to be analyzed with the method used here. However, considering further studies, it may be worth mentioning these cases.

At least Henkel has run a third pilot with a German drugstore chain dm-drogerie markt[42]. On the retailer side again: Metro has new pilots with several parties, including Kimberly-Clark, SCA, Johnson & Johnson, Colgate-Palmolive Co, Gerolsteiner, Philips, and reportedly also Henkel and Unilever[43]. Delhaize has started something with Masterfoods[44], and Sainsbury's has been active with Kraft regarding some coffee products[45]. An up-stream pilot between a supplier

[42] Seifert, 2002. p.156-165
[43] Accenture, 2003. (presentation)
[44] Accenture, 2002. p.37
[45] Accenture, 2001. p.76-77

and a manufacturer only has been reported between Europa Carton and German Schöller[46].

Two other Finnish pilots are apparently under execution as well. One has been started between the retailer Kesko and Raisio, which is a manufacturer of foodstuff chemicals and edible oils[47]. Ketjuetu and Unilever have started the other one – this time in collaboration also with the confectionery manufacturer Cloetta Fazer[48].

[46] Accenture, 2001. p.77-79
[47] Itämeri & Surakka, 2003. (presentation)
[48] Virkkunen et al. 2003. (presentation)

4 CROSS-CASE ANALYSIS

The most interesting and potentially the most meaningful patterns and interactions found during the case analyses are presented in this chapter. These key issues are grouped under two topics: the findings related to projects' scopes and the summary of their results.

4.1 Scope of Pilot Projects

This section summarizes the findings from each of the five questions regarding the scope of the pilot projects.

Project Participants

Regarding the first question, the most interesting finding was that the analyzed projects seemed to concentrate in the middle of the supply chain. This is illustrated in the figure 4 below.

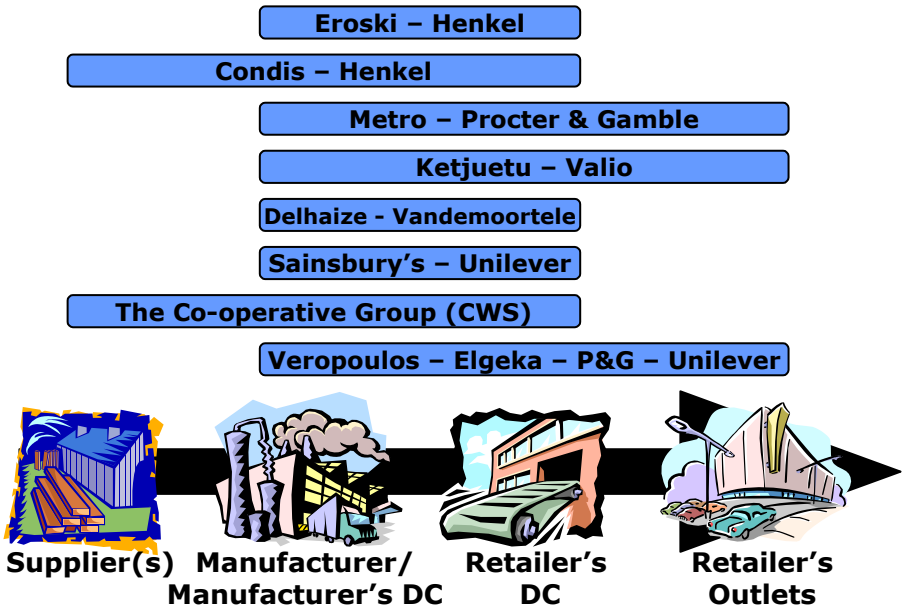

Figure 4. Participants in Pilot Cases

At least to the author it was quite surprising that only in three cases the retailer's outlets were taken along too. By all means it is true that CPFR is to be used in any part of the supply chain but several issues speak in favor of keeping a closer contact to the actual consumer interface. One of these lies in the foundation of the whole ECR concept behind CPFR. Another is based on the

views presented in the literature. However, these issues will be discussed further in the next section.

Piloted Products

The second finding related to the question about the type of the piloted products. The results on that are summarized in the table 1.

Table 1. Nature of Pilot Products

PROJECT	Standard Category	Seasonal/ Promotional	New Product Introductions
Eroski - Henkel		✓	
Condis - Henkel		✓	
Metro - Procter & Gamble		✓	
Ketjuetu - Valio	✓	✓	✓
Delhaize - Vandemoortele		✓	✓
Sainsbury's - Unilever		✓	✓
The Co-operative Group (CWS)	✓	✓	✓
Veropoulos - Elgeka - P&G - Unilever		✓	✓

The table shows indisputably that CPFR was rather tried on special products than in standard every-day business. This sounds quite reasonable for usually standard items have relatively constant and predictable demand patterns. Thus, forecasting them does not require sophisticated methods.

Forecast Levels and Use of POS Data

The question regarding the forecast generation brought about the third finding. It was the prevalence of the DC level aggregation. The figure 5 below shows that only in two cases the forecasts were done for the store level.

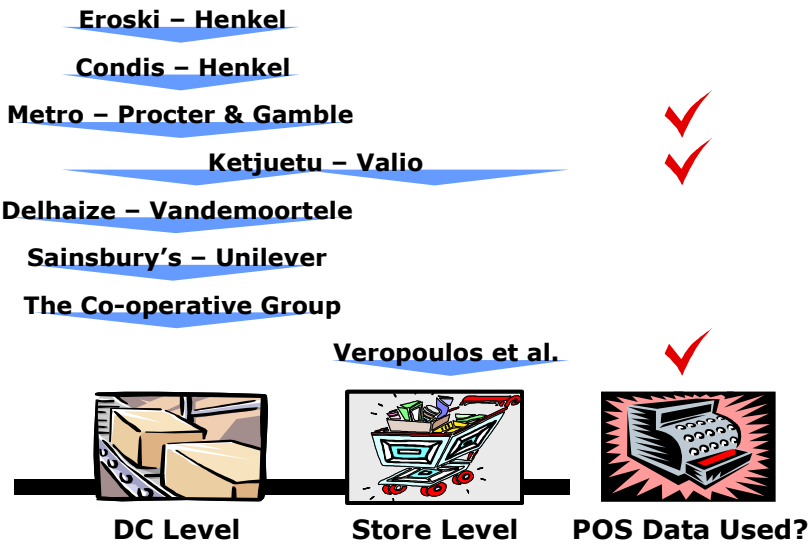

Figure 5. Forecast Levels and Use of POS Data

In addition the above shows that POS data was relatively rarely used. Again the notion is the same as with the first question: the distance to the consumer was quite surprising.

Piloted Process Steps

The task of finding the piloted CPFR process steps proved to be the most invidious part of the analysis. That was because usually the reports told that the whole process with all nine steps would have been implemented. However, in the most cases it could be red from between the lines that this clearly was not the situation. For instance the reports often gave detailed descriptions of the sales forecasting process, meanwhile the order forecasting was seldom described at all. Especially noteworthy was that explanations for the exception handling were always either absent or vague.

Considering the sources of the reports: consultancies and VICS itself, one particular explanation to the above could be thought. Couldn't it be that the steps found too complicated or just failed had been skipped in the documentation?

The table 2 below is provided to give an idea of the notions related to the reported process steps.

Table 2. Piloted CPFR Process Steps

PROJECT	Process as Reported	Reason for Suspicion
Eroski - Henkel	1 to 9	The forecasts were provided solely by Henkel. Thus the collaboration had to be limited.
Condis - Henkel	1 to 9	
Metro - Procter & Gamble	3 to 6	No reason, the restrictions were admitted.
Ketjuetu - Valio	1 to 9	The focus of the collaboration seemed to be on the steps 1 to 5.
Delhaize - Vandemoortele	1 to 9	Apparent inability to solve the order forecast exceptions.
Sainsbury's - Unilever	1,2 & 6 to 9	Curious definitions for exceptions.
The Co-operative Group (CWS)	not actually CPFR	No reason. CWS's own process had similarities with the steps 3 and 9 though.
Veropoulos - Elgeka - P&G - Unilever	not actually CPFR	No reason. However, the process had similarities with CPFR regarding to the sharing of forecasts.

Project Responsibilities

The last question disclosed an interaction between the responsibility sharing and the nature of both: the results and the gained impressions from the project. Here the latter means impressions from CPFR in general. This interaction is shown in the table 3.

Table 3. Project Responsibilities and Results

PROJECT	Responsibility	Nature of Impressions	Nature of Results
Eroski - Henkel	On Henkel due to the centralized forecast generation	positive	mostly soft
Condis - Henkel		positive	calculable
Metro - Procter & Gamble	shared	challenging	soft
Ketjuetu - Valio	shared	challenging	soft
Delhaize - Vandemoortele	shared	negative	soft
Sainsbury's - Unilever	shared	positive	soft
The Co-operative Group	Hard to define due to the internal nature.	positive	calculable
Veropoulos et al.	Apparently mostly on Veropoulos	positive	calculable

The above illustrates rather clearly that the shared project responsibility correlated with the less convincing results. Especially notable is that the correlation was manifested not only in the impressions but also in the nature of the collected, or at least documented, results. None of the equally run cases provided hard, quantitative data from the results.

4.2 Results from Pilot Projects

The table 3 already showed that the nature of the documented results was quite often rather soft. With soft I *firstly* mean comments like: "enhanced communications" or "better understanding of the market place". *Secondly*, here soft stands also for more concrete-sounding results like "increased sales" or something similar, whenever there was no numerical evidence of it.

When considering the nature of results it should be noted as well that the cases providing softer results, were in fact the ones trying to follow the CPFR process more narrowly. *On one hand* this notion is supported by the obvious fact that CWS's and Veropoulos' projects did not even carry the name CPFR. *On the other hand*, Henkel's projects differed from the orthodox CPFR in the sense that the

other parties did not participate in the forecasting – or at least did not "in the beginning" as it was told.

Another pattern closely related to the above notion was apparent too. It was that the same *shared* and *soft-results-providing* cases were in effect also the ones providing more modest results and expressing more pessimistic views of the applicability of CPFR. This can be seen in the table 4.

Table 4. Summary of Results

PROJECT	Most Emphasized Results	Other Notions
Eroski - Henkel	Improved **forecast accuracy**.	Other benefits listed but not measured include: increased availability, reduced inventory levels & enhanced operations management.
Condis - Henkel	Improved **forecast accuracy**, service level at DCs, delivery performance & promotions management.	Enhanced operations and inventory management.
Metro - Procter & Gamble	(Not really published.)	Challenges in collaboration & responsibilities
Ketjuetu - Valio	Slightly improved **forecast accuracy**.	Generally rather modest views of results & **applicability of forecasts**.
Delhaize - Vandemoortele	Improved **forecast accuracy** & promotions management.	Difficulties in **applying the forecasts**.
Sainsbury's - Unilever	Improved product introductions & promotions management.	CPFR found inapplicable for everyday business & standard items.
The Co-operative Group	Improved store level availability.	Enhanced communications & other 'soft' benefits.
Veropoulos et al.	Reduced stock-outs & inventory levels.	Very positive insights for applicability and scalability of the collaboration.

Still another highlighted issue in the table is related to the accuracy of forecasting. An interesting point is that while in the most cases *the increased forecast accuracy* was listed among the key benefits of CPFR, at least two of the cases clearly stated problems in actually using the forecasts for anything. Here the earlier mentioned suspicion for the source reliability is lifted again. Obviously increasing accuracy is a lot easier task than adapting manufacturing, logistics, and in-store operations to use the forecasts. Thus, it could be that emphasizing the forecast accuracy would be used to cover the lack of more tangible results.

5 SYNTHESIS

The synthesis of the cross-case analysis is drawn in the following way: *First*, the conclusions from the findings are drawn and discussed. *Then* these conclusions are compared to the existing research on the subject. *Finally*, the conclusions are summarized as a brief thesis.

5.1 Conclusions

Four aspects of a fundamental kind can be compiled from the cross-case analysis. They arrange under the titles: *the results from CPFR*, *the distance to the consumer*, *the principles of CPFR*, and *the practice of CPFR*.

Results from CPFR

According to VICS and several other sources[49] the promise of CPFR lies in the benefits that include at least: *increased forecast accuracy*, *new business opportunities bred from the closer collaboration*, *increased sales*, *reduced inventory levels*, and *enhanced production planning* (see the section 2.4). All of these can be found among the reported results as well. However, considering the table 4, most of the pilots seem to fall short from realizing all or even the most of the promised benefits. This seems to be the case especially with the four more CPFR-like cases identified earlier (i.e. the ones highlighted in the table 4).

A variety of conclusions could be drawn from this notion. For example, it could be said that some of the cases were implemented poorly, or that the most significant benefits from CPFR are not about to be realized yet during the piloting phase. One could also explain that apparently CPFR just is not the way to do it. However, jumping into such conclusions already would be premature.

Distance to Consumer

The figures 4 and 5 revealed that on average the studied cases focused relatively far from the customer interface. It was also learned that the use of the POS data in forecast generation was rather an exception than a rule. Considering the views of VICS that were presented in the chapter 2, these findings should not be contrary to CPFR. However, when compared to various other sources they

[49] e.g. Seifert, 2002. p.102

really seem a bit weird. For instance, already once quoted Lawrence Fennell of Wal-Mart has stated: "*The focus is the consumer, not the distributor or a warehouse… It is the consumer response validated by actual POS sales and then everything is rolled up starting from that point of contact.*"[50]

It is noteworthy that the above is not just a personal opinion. In many articles the significance of POS data is especially emphasized. Actually, many sources indicate that the use of POS data with CPFR is self-evident. For example, Progressive Grocer has written: "*The power of CPFR is that it uses POS both for everyday replenishment decisions and historical POS data to provide a better predictions of future demand…*"[51]

While the disuse of POS data proved to be surprisingly common, it clearly did not prove to be a critical success factor. This is because the use of it did not obviously save projects by Metro and P&G or Ketjuetu and Valio from accomplishing just relatively modest results. Meanwhile The Co-operative Group and Henkel's projects seemed to run quite plausibly without the POS data.

Principles of CPFR

CPFR builds on the principles of *partnership*, *sharing a single forecast*, and *integrating the forecast into the production planning* (see the section 2.2). From this perspective the cases seemed to fit quite well into the CPFR concept. Especially the importance of partnership is emphasized in the reports. Also, a common factor among the cases seemed to be the agreeing upon a single sales forecast. However, what becomes to the integration and the actual use of the forecast, things get a bit more obscure.

On one hand, it can be pointed out that two of the cases straightly admitted the inability to use the forecasts operationally (see the table 4). For instance, it was stated that the order forecast was not of any value as it "was subjected to logistics constraints"[52]. According to the theory, that should be the situation exactly! However, it does not mean that order forecasts are not of any value. Instead, the order forecast should represent the replenishment plan. Should the

[50] Seifert, 2002. p.131
[51] Lewis, 1999. p.70
[52] Accenture, 2002. p.37

plan meet "logistics constraints" then the constrained parts should be handled as exceptions and resolved in collaboration (step eight).

On the other hand, seemingly in every case the forecasting horizon was lengthened from the pre-CPFR situation. Presumably this had been done in the spirit of CPFR – that is to say in order to synchronize the forecasting and production planning horizons. If so, clearly a step into the right direction had been taken. However, it must be understood that adapting one's operations management or planning procedures to exploit the newly available forecasts is quite a task. Thus, it is not a surprise that many of the pilot projects could not yet deliver results like decreased inventories or increased in-store availability. The understandable inertia in the accumulation of benefits could be the reason why the most common reported result was only the increased forecast accuracy and nothing more tangible than that.

Two lessons should be learned from the above points. *Firstly*, the function of forecasting needs to be understood. Forecasts are done to enable better operations. So, operations usually need to be changed in order to exploit this opportunity. *Secondly*, changing the operations is not a trivial task. The cases studied testify that it likely takes longer than one or two CPFR pilots to realize the most lucrative benefits.

Practice of CPFR

The above concluded that the cases were mostly aligned with the principles of CPRF. However, as the findings related to the piloted process steps (see the table 2) implied, the implemented tools were not necessarily the CPFR processes in the form purveyed by VICS (see the section 2.3).

The case analyses strongly suggest that resolving exceptions and forecasting orders were found challenging. On the part of the exceptions this makes a lot of sense. In the author's opinion the definitions for exception in releases by VICS[53] are very ambiguous. Considering this, it is quite understandable that the participating companies seemed a bit confused. The meaning of an exception was understood in different ways.

[53] VICS, 1999 and VICS, 2002.

The most common interpretation was that an exception is generated when the two forecasts from the participants differ in excess of a certain tolerance[54]. Another interpretation was that an exception is triggered when a certain level in some ratio, such as the inventory fill-rate, is reached[55]. Yet another one was that a certain statistical attribute within a time-series-based forecast would act as the trigger[56]. Furthermore, it has to be admitted that there were also definitions, which were just incomprehensible[57].

What becomes to the order forecasting steps, it is quite evident that if already the exception handling is blurred and in addition to that the whole role of order forecasting is not understood, as was discussed earlier, the conditions for successful order forecasting are not too favorable.

These problems were generally bypassed in two certain ways. *In the first case*, the forecasts were not done jointly. This was the situation with at least Henkel's projects and with Veropoulos. *In the second case*, the sales forecasts were used as they were for the order generation purposes. Despite some reported problems with the in-store inventories, this approach seemed to be quite suitable for Ketjuetu and Valio whose business is characterized by fast cycle times. Likely the same applies to Vandemoortele and Delhaize as well.

This perception suggests that CPFR had been generally used without some of its core ingredients. Wouldn't that then justify the questioning of the whole concept as it is? Or should one ask: are the improvised solutions good enough or should instead the CPFR process be better communicated and more carefully implemented? These are remarkable questions, which still remain unanswered.

5.2 Comparison to Existing Knowledge

Despite the novelty of the topic at hand, some other publications related to the above-discussed aspects exist. A brief comparison is provided below.

Results from CPFR

The notion that CPFR projects seem to fall short from realizing most of the promised benefits found support from a study done in the United States. The

[54] e.g. Accenture, 2002. p.45
[55] e.g. VICS, 1999. p.12
[56] e.g. VICS, 1999. p.17
[57] Accenture, 2002. p.49

Grocery Manufacturers of America (GMA) has published a survey covering CPFR experiences in 21 American companies[58]. One of its key findings is presented in the figure 6.

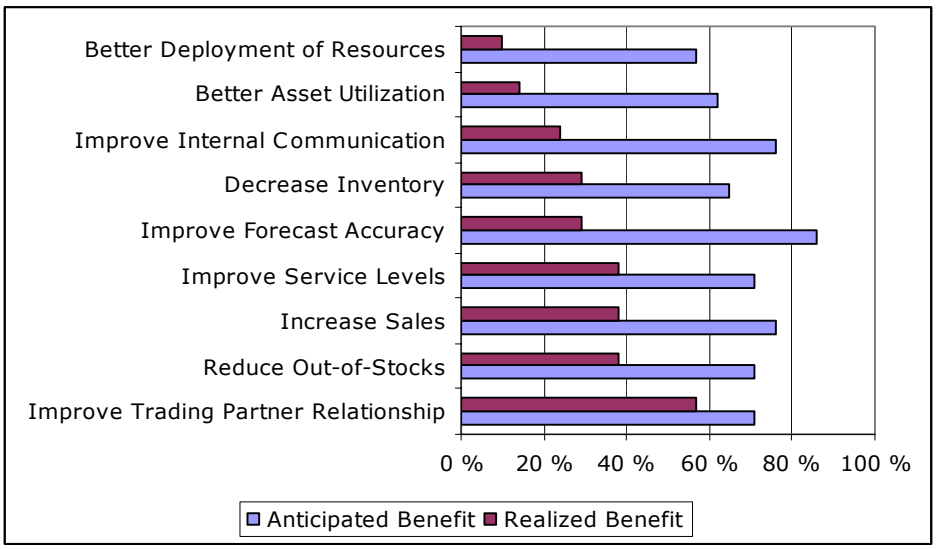

Figure 6. Anticipated and Realized Benefits of CPFR [59]

From these figures it can be calculated that only 43 percent of the anticipated benefits had been realized. This fact testifies that modest results are not just a European issue. Also, it gives rise for a suspicion of whether CPFR is all that adapted and well running in the US either, though some sources seem to strongly advocate so[60].

Distance to Consumer

The lack of both: the store level forecasts and the use of the POS data, gets a controversial reception when compared to other studies.

On one hand, studies show that retailers are often quite reluctant to forecast at all[61]. In these cases the responsibility forecasting is obviously left to the manufacturers. Considering that the outmost interface of the manufacturer is likely retailer's DC, it should be quite understandable that the range of the forecasting is also set there. It would be rather unrealistic to suppose that the manufacturer would bear enough knowledge or will to understand its retailers'

[58] KJR Consulting, 2002. p.xi
[59] ibid. p.27
[60] e.g. Fliedner, 2003. p.17-18
[61] Richardson, 2003. p.34

businesses on the store level, especially if the retailers are not interested in information sharing either, which can be the case as well.

Thus it seems that in many cases the DC level is quite natural forecasting range. Even more so when considering that typically the replenishment from the retailer's DC to the stores is that efficient and its cycle times that short that forecasting further would not pay for its effort[62].

On the other hand again, many sources still speak in the favor of reaching the contact point out to the end-customer[63]. However, it seems that these two viewpoints can be combined to make sense together. Such a combination would be based on the reason that while the aggregated forecasts seem to be sufficient, it is still worthwhile to build those forecasts from the data that has been collected at the POS. This would be a perfectly reasonable conclusion because collecting and sharing that information should not be much of an issue these days and because presumably the quality of forecast improves when more up-to-date data (i.e. the POS data) is used – even if the forecasts were aggregated.

Principles of CPFR

The conclusions raised a concern about whether the improved forecasts were used in the operations management and planning or not. This issue has been reported at least once before. Kimberly-Clark has shared some of its own experiences, which include a situation where the forecast accuracy was enormously improved. However, that benefit was neatly offset by a concurrent increase in the inventory levels[64].

This experience should validate the conclusion that making the use of the forecasts is not easy. However, as some of the studied cases clearly demonstrate, the value of seeing the effort in integrating the forecasts into the operations should not be underestimated.

Practice of CPFR

The last conception was that the companies were performing quite questionably with the exception handling and order forecasting. A survey done among 51

[62] Småros, 2003. (interview)
[63] Katz & Hannah, 2000. p.80
[64] Accenture, 2003. (presentation)

companies from the VICS CPFR contact list[65] reached a similar conclusion. One of its key findings was that companies had considerable difficulties in taking the process through the sales forecast exception handling and all of the order forecasting steps[66].

So, it really seems that this study is not the only one pointing out problems that contradict the CPFR gospel provided by for example VICS. However, pointing out problems alone is not constructive. If one just states that CPFR is a too cumbersome of a process[67], then one should also offer something better to replace it. CPFR has very ambitious objectives, so it should not be a surprise that reaching them is not an easy trick.

Nevertheless, literature implies that there are other approaches to the issue than CPFR. For example, it has been suggested that *efficient information exchange and collaboration in planning in general* is more important than *generating accurate forecasts* or *following formal exception handling procedures*[68]. And actually, the original ECR Scorecard by GCI does not state that explicitly CPFR should be used in the collaborative planning[69]. The emphasis on CPFR could be resulting from the influence of VICS. However, comparing CPFR to alternative and less spread-out collaboration models is not in the scope of this study. Nevertheless, it clearly looks like such a study could be quite interesting.

5.3 Thesis

The conclusions and the discussion above aim to address the most important part of the research problem. That is the question about *what can be learned from the CPFR implementations*. The following wraps up the lessons in a form of a thesis.

The CPFR concept appears to build on three things. The first is the foundation formed in *the principles*: the partnership, the shared forecast and the integrated use of the forecast. The second provides the means that is *the nine-step process model*. The third is the motivation: *the promised benefits*.

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65 Barratt & Oliveira, 2001. p.272
66 ibid. p.278-281
67 e.g. Corsten, 2003. (presentation)
68 Småros, 2003. p.12
69 Global ECR Scorecard. URL: http://www.globalscorecard.net/index.asp

This study proved that the foundation is by all means healthy. Also, the promised benefits have proved to be both: worth striving for and reachable. What was left unproved was that if the nine-step process is the right or the best way in getting from the principles to the benefits.

It was noted that fair deal of confusion hovered around the process model. Thus, it seemed to be recommendable that companies would evaluate the applicability of the model, before trying to force their businesses into it. Very likely the model requires some adaptation and customization when applied to different environments. In addition, it should be noted that CPFR is not the only model around. When starting an initiative to enhance collaboration, the applicability of not only CPFR but also other approaches should be evaluated. Because of its prominent status CPFR could provide a good benchmark when evaluating other models or current procedures already evolved during earlier collaboration.

However, before getting to a point where CPFR is used for anything, whether it is as a process tool or as a benchmark, the confusion around it should be abolished. The CPFR candidates have to understand *the meaning and the use of exceptions* as well as *the role of order forecasts as replenishment plans*.

In addition to the above, one more issue was carried through the discussion. It was the consideration of the relationship between the forecasts and the customer interface. The conclusion was that aggregating forecasts to the level of distribution centers can be often more reasonable than trying to extend them to the store level. The other notion was that, due to its quality, the forecasts should be based primarily on the POS data, whenever it is achievable.

The above conclusions summarize in a thesis that is a suggested framework of how CPFR should be implemented considering the lessons learned in this study. The thesis is illustrated in the figure 7.

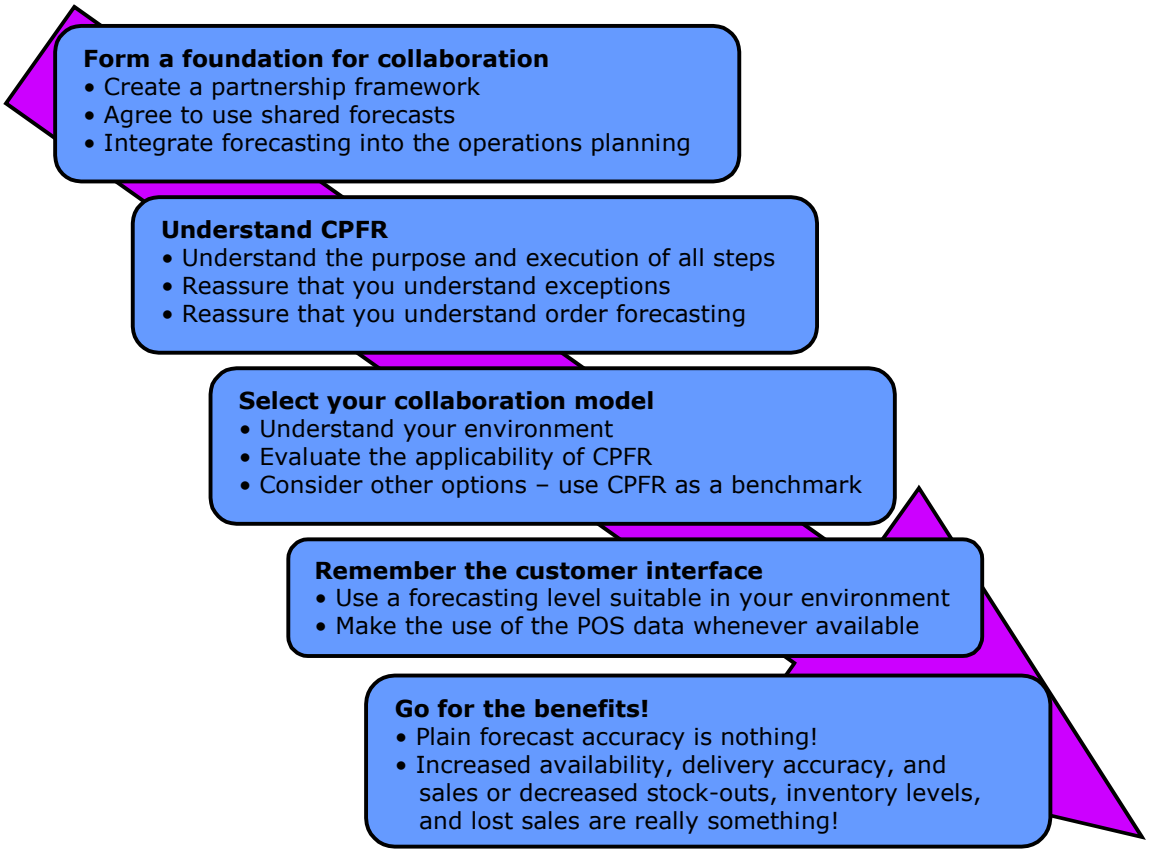

Figure 7. Thesis: Framework for CPFR Implementation

6 REVIEW

This final chapter takes a critical look at the validity and the reliability of this study and provides suggestions for further research.

6.1 Validity and Reliability

The validity of research results refers to their ability to describe the very issue that was stated in the research problem. Thus in this study it means the ability to provide answers to the presented questions. Then again the reliability of a study stands for the probability of those answers being the right answers. Due to the qualitative nature of the research, the only means to estimate these attributes is the use of critical judgment.[70]

Validity of Results

The three questions of the research problem were addressed in the following way: The case analyses and the cross-case analysis regarding the scope of the projects was meant to answer the question: *how*. Similarly the analyses regarding the results were addressed for the question: *where the projects have led into*. The conclusions, the comparison to the other studies, and the thesis were meant to answer the question: *what can be learned*.

The way to estimate the validity of the study is to question if the five questions of the scope really described the scope in sufficient detail, or did the discussed results describe the real meaning and value of the projects, or were the conclusions and the thesis really based on the research. These issues are obviously up to the reader to decide.

Reliability of Results

Again, estimating the reliability is not that straightforward anymore. Here the key question is: were the sources and the method reliable? Here it should be considered whether the use of only six sources gave enough perspective and objectivity to the study. Especially it should be noted that an advocate of CPFR, namely ECR Europe had published two of the most used sources. The possibility of bias should be considered.

[70] Järvenpää & Kosonen, 1999. p.28-30

However, the possibility of bias was recognized and addressed in two ways. *Firstly*, the preformatted structure was used in describing the scope, *and secondly*, the reported results were viewed rather critically. The latter again bears a risk of being in fact too critical. This could have meant for instance that some of the "softer" benefits were left with too little attention.

Finally, when considering the reliability of the final deliverable: the thesis, it should be born in mind that the suggested framework has not been tested in reality at all but is only based on the findings from the study. So again, the relevant questions are provided and the judgment is left to the reader.

6.2 Topics for Further Research

During the progress of this study, two interesting questions revealed to the author. *The first* was whether the original assumption that CPFR is well adopted and widely in use within the American retail industry is justified at all. Closer scrutiny required for this research disclosed that the American retail industry is not as unanimous on the applicability of CPFR as most of the prevalent literature on the issue suggest. Thus, it should be interesting to carry through a similar study like this in North America also.

The second question is quite closely related to the first one. Here the interest emerged from the revelation of that maybe CPFR – at least in its current form – is not the best way to collaborate in the planning. This aspect brings about the question of what are the other possibilities? Exploring them could possibly provide some really valuable insights.

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