Integrated Collaborative Planning Within the Supply Chain: The Future of ERP

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Abstract

By examining case studies using Collaborative Planning it becomes apparent the need to integrate with Enterprise Resource Planning applications. This process would help avoid errors, save time, and produce cost reductions across the supply chain.

Introduction

Enterprise Resource Planning (ERP) has become a boon to many corporations with its ability to integrate information systems through out a corporate structure. By using central databases and information sharing, departments can save money, reduce time for different operations, improve communication, improve customer service, and reduce errors. With ERP's success on the corporate level, it has become apparent that a benefit can be obtained by integrating the supply chain in the same fashion. This year PeopleSoft and SAP have introduced new modules to help companies manage supply chain integration. Collaborative Planning is the technology needed to advance corporations in the future.

The Bull Whip Effect

The bullwhip effect happens when a constant demand becomes varied throughout the supply chain. This phenomenon happens because of lack of communication and each member of the supply chain must make their own forecast based on the current demand of the other members. If a retailer forecast the inventory levels that they need and pass this demand on to the wholesaler, then the wholesaler will make forecasts based on the new demand from the retailer. Since the data was achieved from a forecast and not actual sales or POS data, most likely the forecast will be off. Now, when the wholesaler places an order with the distributor with the newly skewed numbers, the wholesaler will make an erroneous forecast since their demand data is incorrect. They will pass on the distorted demand to the factory. This effect causes peaks and valleys in the ordered. This happens because when the retailer orders too much and it is multiplied throughout the supply chain, it creates a surplus. Now that there is a surplus the members tend to overreact and order to little, but at the same time that number is diminished each step in the supply chain causing

a shortage. By sharing sales data between the members they can better forecast together what the demand will be, thus defeating the bull whip effect.

There are many benefits by attacking the bullwhip effect that the members can realize. By smoothing out the ordering demand and eliminating the peaks and valleys that are associated with the bullwhip effect, CPFR can help increase the retail in-stock levels [3]. A retailer increases sales when they increase the in-stock level because they do not lose potential sales. This also gives the power to incorporate category management strategies, which in turn allow for better product mix and promotional timing. Retail outlets can also carry lower safety stock since the forecasted data will be more accurate. This also creates a new operating platform for the manufactures. Before they were in a push system where they would create the product and push it on the customer. Now they can move to a pull environment where they pull the demand from the customer. This is also a make-to-demand model compared to a make-to-stock model. The advantage in this is that safety stock for all members is decreased, while inventory cost decreases simultaneously. Greg Belkin of Retailsystems.com suggests another benefit of CPFR is that it crash-proofs the supply chain. Since the data is in real time, companies can respond quickly to extreme changes in the supply chain, including the loss of a distribution center. Because the members of the supply chain have a real time collaboration tool, they can jointly solve the problem and rectify the problem quickly. Belkin as states that a company's stock price can drop on average 8.62% on news that there has been a disruption in their supply chain.

Decreased inventory levels translates to freed up capital. Since less warehouse space is needed, less money needs to be invested into buildings. Fewer inventories are purchased at one time freeing up more money for the company. This can lead to being out of debt. It also opens many doors for the company as they may increase marketing budgets, increase research and development, or spend more money on quality testing.

CPFR: A Viable Solution

CPFR stands for Collaborative Planning, Forecasting, and Replenishment. "CPFR [is] a web-based standard that enhances vendor managed inventory and continuous

replenishment by incorporating joint forecast" [9 p.239]. The process involves two or more companies comparing their historical data, such as demand, sales, and inventory levels. The two companies can then compare where there are differences of discrepancies and work together to create better forecast. The overall goal of CPFR is to synchronize all the members of the supply chain. The goal is to open up the communications between members of the supply chain and allow for better forecasting. Information that is shared between the members is past sales trends, scheduled promotions, and forecasts. BusinessWeek.com reported that companies could enjoy a three-point increase in their overall profit margin by implementing CPFR. The ultimate goal of CPFR is to provide more accurate information that can add value to the supply chain by increasing sales and profits.

The main benefit of this process is it attacks the bullwhip effect. As can be seen later in the Heineken case, better forecasting and planning were achieved. Lead times were reduced which led to better customer service. Processes and procedures became automated and required less human effort. This also improved their inventory management as well.

Rosettanet

Rosettanet takes the benefits of XML and EDI while omitting their drawbacks. EDI's strong point is that it consists of strict standards. These standards make it possible to easily program applications that can abide by the rules set forth by the EDI standards. This also makes it possible for generic applications that can be implemented throughout the supply chain. XML's strong points are the fact that it can be deciphered by humans, codes are replaced with descriptive tags, an HTML capable browser can easily read the files, thus allowing for easy transfer over the Internet.

Rosettanet uses dictionaries that contain the standard tag definitions used in XML files. For example, referTo will always mean the partner to which a business document request is being referred. And anytime the partner to whom a business document request is being referred will always be listed in a referTo XML tag. True a tag named address would be easily recognized by the human eye and be deciphered to what it means, however a computer must be programmed to know what address means. By making these dictionary files the computer can comprehend what the data means and how to interrupt it. All members of the supply chain agree upon these dictionary standards.

Heineken: Implementing Supply Chain Integration

In 1997 Heineken launched a pilot program that took advantage of the Internet. Heineken had many problems before the new pilot was launched. There was very inefficient communication through out the supply chain. This lead to many problems that were associated with the bullwhip effect. Heineken had a police-like relationship with many of its customers and distributors. Lead times were excessive and this lead to outdated products being purchased by consumers. Forecast were inaccurate as it overwhelmed the sales force with paperwork. Inventory management was inconsistent. With these problems in mind, Heineken had decided that they needed a new solution to fix these problems. In 1996 they teamed up with Logility to tackle this problem. The challenge set fourth for Logility was to make most processes integrated. This included creating tools that would allow marketing planning and sales planning to communicate. Elimination of data collection by fax needed to become a reality. Inventory management needed to be fixed. Automated processes needed to be installed that would eliminate manual processing.

The plan was based off of creating a central planning organization that was created from the bottom up. This plan would drive the initial forecast for all areas. This way every department would be working with the same numbers and goals. The forecast were also shared with the distributors, since they have knowledge of their respective markets they could communicate any errors in the forecast. Since computers did the ordering based off the forecast, less human labor would be required and errors could be prevented. The system would also communicate marketing and promotional information to distributors. This would allow the distributors to expect an increase in demand while the promotions were active.

Forecasts were made based off of consumer data. By collecting sales inputs, Heineken would be able to integrate it with marketing plans, financial goals, company objectives, and various strategic plans. Logility designed a pyramid structure that supported forecasting information from remote and distributed sources. It then merges the data and each department can have access to it.

Summary of other Benefits

Heineken realized many other benefits as well. Forecasting and planning improved. Customer service improved overall. Self-regulating order planning became plausible. Heineken was able to adjust for inventory variances that were due to forecasting errors. Inventory management improved. Lead times decreased, which in turn also increased customer service. Most processes and procedures became automated reducing the number of manual tasks. Communication became a stronger and more focused tool. It gave the perception that Heineken was a leader.

Dell Computers and Agile Software

Dell Computers makes customized computers with orders that are fulfilled in a goal of five days. Dell wished to improve margins, market shares, and response to its environment. Dell strived to help ensure rapid, error-free manufacturing and delivery of the exact products specified by the customer using CPFR with their parts suppliers. To accomplish this task Dell used Agile Software Anywhere Software Suite. This software helped ensure that the parts suppliers delivered the correct part at the right time. The Internet is the backbone of this process [1]. "[T]he result has been super-charged growth -- as competitors have lagged." [11]

Agile Anywhere software suite consists of five software titles that help automate and distribution and synchronization of product information. The first application is called Agile eHub. This program handles storage, web distribution, and administration or product information that is available to all members of the e-supply chain. Agile Product Change Server automates the routing and notification of engineering changes. Agile AML Server links manufacturers with Dell and allows Dell to monitor and approve new products. Agile Product Definition Server provides a web-based environment that manages parts, documents, Bills of Materials, and drawings. [1]. The advantage of the Agile Anywhere software is that Dell and its parts suppliers can easily collaborate over the Internet.

i2 and Home Depot

Home depot was looking for a way to plan collaboratively with their suppliers to manage truckload capacity. Though there are many economic advantages to this, Home Depot was concerned about improving service. Home Depot enlisted the services of i2 Technologies. By using i2's carrier bid optimizing solution, Home Depot was able to request bids for truckloads as suppose to less-than-truckloads orders. The carriers would then return bids. Home Depot then analyzes the bids and can begin negotiations with the suppliers. This helps Home Depot provide lower prices [6].

Before 1996, Home Depot had a completely manual system used for bidding on lanes. In 1996 they allowed carriers to place their bid on excel spreadsheets. However, even the new system they devised did not allow carriers access to Home Depot's demand. Because of this flaw, a carrier would have to assume that the demand would stay relatively constant throughout the year, thus skewing their forecasting abilities. Another drawback was the fact that carriers could not bid on a group of lanes that they could better optimize. If the carrier had more lanes, they could fill the trucks fuller. However, it would become uneconomical if they did not win the bid on a lane that was in the middle of other lanes that they had won the bid on.

In January 2000, i2 created an Internet based bidding system that allowed important access to some of Home Depot's data. Detailed information about lanes was provided, including exact origin and destination data. Before, only the zip code was provided. Demand forecast were also provided which allowed bidders to better analyze the situation and to better forecast their cost.

By using collaborative management, Home Depot was able to get better rates overall for their transportation needs. The carriers also reported that they were overall happier with the new system. Even though they were charging less, they were able to make more profit because they could manage their business better with informative data that Home Depot provided. The main complaint that the carriers had was that the training was too short, but overall the program was a success.

Why ERP?

ERP becomes the choice medium for Collaborative Management because it already compromises the data and applications that need to be used. Since ERP vendors such as PeopleSoft have converted to applications based off the Internet it becomes possible to easily augment the ERP software to better cater to Collaborative Planning. By implementing such standards such as Rosettenet and CPFR, an ERP vendor can create a portable application that can be used by all members in the supply chain and still communicate with the ERP software.

It must also be noted that the most important pieces of data include marketing and promotions, inventory levels, sales, and forecasted demand. This list is already handled by ERP software and the data is readily available. To create a stand-alone application would require extra data conversion and may be hindered by software upgrades that can hinder the data communication between the ERP database and the stand-alone application.

Just In Time

Collaborating can reduce Just In Time cost. If the supplier can better forecast the demand of the manufacture, the supplier can in turn reduce their safety stock requirements and better forecast labor, reducing their cost that can be passed on to the manufacture.
Using ERP software to share promotions and historical data, the supplier can create better forecast. Other functions such as purchasing may be handled automatically.

Problems Associated With Collaborative Management

The biggest issue that arises with collaborative management is trust. Many managers do not wish to share viable information. There is a real concern because a leak of

this information can hurt the company's competitive advantage. To combat this both parties may need to understand the value that will be acquired by this process. A commitment of trust needs to be established. Also, software can be used to analyze actual shipments and shared data to double check numbers that are being shared.

Conclusion

The future of ERP is defiantly headed into the direction of collaborative planning. This practice allows each member of the supply chain to share the cost of a single process instead of each member having to pay for the exact same process, doubling the total cost. Also many cost advantages appear when each member of the supply chain makes better forecast. It may be concluded that this competitive weapon may beat those firms that do not practice collaborative planning.

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