MIT SCALE RESEARCH REPORT

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Transforming Supply Chain Through Collaboration
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KEY INSIGHTS

1. Identified the key requirements for VMI and CPFR collaboration methods.
2. A framework to check the readiness of the firms before implementation
3. Guidance for the implementation of VMI and CPFR

Introduction

Collaboration is a supply chain topic that has been debated on several occasions in the last two decades. Many successful case studies have been published and numerous mathematical developments have proven the benefits of it. It should also be noted that during these last two decades, many different methodologies have come up but even with all the progress made, collaboration between supply chains has not emerged in the expected manner and none of developed methodologies have been implemented to a great extent. Under the current scenario, we have attempted to understand the fundamentals behind Vendor Manage Inventory (VMI) and Collaborative Planning, Forecasting and Replenishment (CPFR) and to study their pros and cons.

In VMI, the supplier monitors the buyer’s inventory levels and makes periodic re-supply decisions regarding order quantities, shipping, and timing (Waller et al. 1999, p. 183). The main benefits of VMI are the reduction of inventory carrying costs and stock out problems. Dong and Xu (2002) show that the inventory related costs of the supply chain, as a whole will be reduced with a VMI.

CPFR is the business practice that tries to reduce supply chain costs by promoting greater integration, co-operation and visibility between different partners in the supply chain (Andrews, 2008).

CPFR has been, in general, beneficial for the organizations that have implemented it. However, it is more beneficial to those companies where demand is hard to predict, for which promotional activities play an important part, or in which new products are introduced frequently, lead time for production and replenishment are long, and where there are short product life cycles (Mohsen Attaran & Sharmin Attaran, 2007).
It involves the regular sharing of information, such as plans for future product promotions between partners and the use of an exception-based process to highlight changes (Waller, Johnson, & Davis, 2001)

The framework

A basic framework is built to answer the questions of the thesis. The basic framework consists of four different aspects: partner selection, matching tool, readiness test and implementation.

Partner Selection

The first step is the partner selection, its main objective is to narrow down the number of possible partners. It consists of two steps, first is based on quantitative data and second one is qualitative analysis of the relationship between the possible partners.

The quantitative approach consists of six Key Performance Indicator (KPI): service level, promotional sales, cycle time, change over, sales volume, and type of replenishment. The partner gets a score depending on their performance on the KPIs.

The company should select the partners with the highest score and then do the qualitative step. It consists of answering three questions about the partner’s ability and willingness to collaborate. Again the ones with the highest score is selected and move to the matching tool.

The matching tool

The main purpose of the matching tool is to compare CPFR and VMI and identify which one of the two will have the greatest impact on the company’s supply chain performance.

The matching tool consist of three scores. The first one comes from the triangle of tradeoffs of the company. The tradeoffs are Service Level, Working Capital Requirements and Supply Chain cost. The company gives a weight to them in order to prioritize their objectives with the collaboration.

The second score consists of a list of KPIs and the impact they have on improving the tradeoff. The KPIs are chosen based on an extensive literature review and some case studies.

The score was given to them depending on the impact they have on the three main tradeoff. Two different score tables were constructed: one for responsive supply chain and another one for efficient one, so that the company can choose the type of supply chain they interact with the partner.

The third score comes from the impact of the different collaboration methodologies on the KPIs depending on their current state. This third score allows to compare VMI and CPFR.

Once the three scores are ready, each score is added up to give the total score. Then, the company should select the methodology with the greatest score.

Readiness Test

The next step, according to the framework, is to check the readiness before going for the implementation. Readiness test is an extra step in order to make sure that the organization is ready to implement. For example, VMI cannot be applied to every supply chain because the organizations might not have the capabilities to implement it, but these capabilities can be built over a period of time. VMI could hinder the visibility in the supply chain when one moves from downstream to upstream by shifting decision making power to suppliers. Other reasons could be incorrect data, lack of system integrations and poor technology at supplier’s location. In the cases of failure that are mentioned above, if the companies would have taken the precautionary step to check their readiness, then they could have avoided the failures. Therefore, the step to check...
readiness before the implementation gives the companies an instrument to launch a successful VMI. The weighted sum of the 20 attributes produces the VMI readiness score. Since the maximum possible score is 4 for each attribute, the range of the score is between 0 and 400. Once the score has been obtained, it is compared with the minimum threshold, which has been kept at 50%. If a firm scores below 50%, then the framework indicates that the firm does not qualify for a successful VMI implementation. If the score falls between 50% and 70%, the framework indicates that VMI could be considered but then the company should also look at the those attributes, which can be improved in a short time and also cost efficient. If the score is low on these attributes, then the company should consider VMI seriously. In other words, even if they do not meet all the requirements, a bit of effort could still make VMI a success. If the firm scores above 70%, VMI is considered to be appropriate, and is a well thought out investment. We have put 70% as an appropriate score for VMI readiness because if the company has 70% of the required attributes, then VMI can be implemented successfully and the remaining 30% would be developed over a period of time.

Conclusions

This thesis has identified requirements for firms to collaborate in a constantly changing market environment. The focus of the research was on CPFR and VMI as collaborating techniques. Firstly, a matching tool is developed that identifies the most appropriate collaboration methodology for a supply chain. Then, a framework is developed to check the readiness of the firms to collaborate before going into implementation.

Two supply chains from our sponsor have been selected to test our results in a workshop with our sponsor. Overall, the readiness tool received a positive feedback in the workshop and our sponsor believes that this tool has lot of practical value and it can be really beneficial for them in future.

Furthermore, as anticipated by the framework, firms with scores less than 50% did not collaborate and firms with scores higher than 70% have implemented the collaboration. A few firms scoring between 50% and 70% have implemented it and others did not.

Though the framework has many valuable insights, there are some limitations to it. First, the weights are determined from literature and opinion of some industry experts for VMI readiness tool and also, we assumed the same weights for every supply chain in various industries, which might not be true, and weights can differ depending on the industry. Second, we assumed company, product and partner have equal weights in CPFR readiness and again it is possible that some firms require different weights. Last, we assumed a neutral approach for the attributes that are not answered in the survey and the results would be more robust if those attributes had been captured through survey.

There is opportunity for further research to refine the threshold limits that are kept at 50% and 70%. A large set of case studies on various industries can help to refine this methodology and provide more accurate values to these thresholds, hence improving the analytical power of the tool.

Guidance for the implementation of VMI and CPFR has also been provided in the thesis. Therefore, in future, the next steps for our sponsor should be first to identify a BU that is willing to take part in the collaboration initiative, and then they should start a pilot project with a key supplier or key customer. Followed the steps that are mentioned in the thesis and after the successful implementation of the pilot project, they can roll out the project plan to the rest of the BU's.

Cited Sources

