How the Best in Class Manage their Supply Chains | White Paper
FIVE ESSENTIAL ELEMENTS OF INTEGRATED SUPPLY CHAIN MANAGEMENT

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PREAMBLE

Manufacturers world over are frantically trying to improve efficiencies in their operations, the urgency further accelerated by the shrinking global economy. Falling customer demand, tighter credit, rising input prices and the economic uncertainty are forcing companies to re-evaluate their business plans especially with respect to investments in new capacities, markets and products. At the same time, there is a renewed focus on making current assets work harder and maximize the return on the already invested dollar. However, achieving operational efficiencies requires more than reducing costs, high utilization mandates, strict inventory control and rationalizing capacity or manpower. There is no denying the usefulness of these steps, but the key is to ensure every bit of the supply chain is performing towards meeting a single objective – right product at the right place in the right quantity at the right time. This requires all operational entities within the enterprise to be integrated through business processes and technological enablers.

Supply Chain Management exists to an end – satisfied customers at the optimum cost. And as markets and businesses have evolved, supply chains have become more complex, more global and a more critical business function than ever before. At the same time, many leading firms have realized that a well run supply chain can be a source of distinct competitive advantage in the marketplace, and have been in the forefront in adopting practices that deliver superlative efficiencies in their supply chain functions. While many have been successful in optimizing important supply chain functions, a few have managed to make their entire supply chain behave as a single linked entity – from end customer delivery to raw material procurements – to achieve truly synchronized operations.

How does a VP – Supply Chain today start building a vision for his/her supply chain in this new world scenario? This paper presents the five initiatives we consider essential in achieving operational integration across the supply chain and how businesses are leveraging these successfully to achieve operational success.

We start by talking about Sales & Operations Planning which fundamentally is bringing together sales and marketing function with the firm’s operations thus ensuring both are working towards a common sales target that has been agreed to be feasible under the given operational constraints. Next we discuss Collaborative Planning, Forecasting and Replenishment (CPFR) which enables accurate demand forecasting by facilitating information sharing between the manufacturer, retailer, and other involved parties. Then we shall discuss Concurrent Engineering that helps firms develop products by involving all internal and external stakeholders leading to more efficient concept to launch cycles. These initiatives require enabling technologies in terms of data and specialized
tools, which usually aren’t shipped as part of vanilla ERP solutions. This brings us to our next element namely Extended ERP, which essentially is an ERP core with peripheral specialized solutions for important supply chain functions. Finally we discuss about Supply Planning, which is about optimizing procurement and inventories.

SALES AND OPERATIONS PLANNING

Two of the most essential elements of a supply chain for any organization are its sales and operations teams. While one represents, promotes, identifies and captures the demand for the organization’s products or services in the marketplace, the other co-ordinates the supply of the firm’s products or services committed to its customers. Both are central to a company’s objectives of higher profits and revenues at lowest possible costs. However, these objectives take a severe beating due to the lack of co-ordination between the sales and the production. This lack of co-ordination has far reaching effects throughout the supply chain. An essential requirement of having an integrated supply chain is to provide visibility across the different functions and enable a seamless flow of material, information and funds across its boundaries. A lack of sync between the demand and supply leads to a fragmented supply chain. A Sales and Operations planning process is the answer to remove this disconnect and forms an essential element for an integrated Supply Chain.

APICS defines the S&OP process as the “function of setting the overall level of manufacturing output (production plan) and other activities to best satisfy the current planned levels of sales (sales plan and/or forecasts), while meeting general business objectives of profitability, productivity, competitive customer lead times, etc., as expressed in the overall business plan”. The Strategic Business Plan sets the company’s long term objectives and gives a general direction on how the organization can best achieve it based on inputs from its sales, production, and engineering and finance teams. The strategic business plan provides the direction and the boundaries to the functional teams to prepare their own plan in line with the organizational objectives.

S&OP process is a collaborative forum where the cross functional teams from sales, production, finance and materials interact with the higher management to track and discuss the changes in the market conditions and its corresponding affect on the sales plan and the Strategic Business Plan every month.
The sales plan captures the sales forecasts for the product families through the planning horizon. The changes to the sales plan are cascaded to the production plan and other functional plans. It provides them the demand visibility in advance to plan and position the resources internally or externally to maximize demand fulfillment within the boundaries of maintaining, raising, or lowering inventories or backlogs, as defined in the business plan. The process is iterative. If the production cannot meet the sales targets due to resource constraints, the sales plan is changed and cascaded again. The output of the S&OP process is the approved Sales plan, production plan and inventory/backlog plan.

Collaborative Planning, Fulfillment & Replenishment

The VICS committee, who have originally defined CPFR and consists of leading retailers, manufacturers and solution providers, defines it as a business practice wherein trading partners use information technology (IT) and a standard set of business procedures to combine their intelligence in the planning and fulfillment of customer demand. By linking sales and marketing practices to supply chain planning and execution processes, it enables trading partners – retailer and manufacturer – to improve visibility into one another’s critical activities through a structured process of information sharing and joint decision making across firm-level boundaries. CPFR helps address uncertainty, of customer demand and all dependent upstream variables. The retailer doesn’t want to lose a sale; neither does a business want lose an order and similarly the material supplier. But customer demand is uncertain and affected by numerous macro & micro economic and environmental factors. Given this situation, usually the above parties protect their sales revenues by building inventories which entail excess procurement, production, logistics and storage thus driving up costs. Information sharing between all trading and internal parties about demand signal, capacities and inventories across the network allows for reduced individual risk hedging measures and productive utilization of effort and resources. By linking sales and marketing practices to supply chain planning and execution processes, CPFR improves visibility into critical activities across the value chain and thus enabling across-enterprise joint decision making.

The VICS committee prescribes a 4 stage guide to implement CPFR. The adjoining figure shows the CPFR reference model explaining the four stages. This model can fit multiple partner relationship scenarios and we discuss here the four most popular deployments.

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1 CPFR Overview Handbook, Voluntary Interindustry Commerce Standards (VICS)
Retail Event Collaboration: Promotions, advertising and such events cause large demand variations in retail environments and unless adequately planned for, lead to out-of-stocks, excess inventory and excess logistics costs. This CPFR scenario presents a collaboration framework that enables all trading partners to capitalize on such planned events. Here, the partners develop joint business plan (annual or seasonal), then work together to determine the impact of such events on consumer demand and distribution processes. Based on the events calendar, promotional orders are placed and delivery made in time for the actual event. In parallel, exception processing continues to handle unforeseen issues, if any, and the cycle ends with an evaluation of the event performance.

DC Replenishment Collaboration: This scenario enables manufacturers to adopt a make-to-demand policy, while allowing retailers to minimize their inventory liability and stock-out risk. Unlike conventional replenishment methods that calculate order quantities for a near-term horizon, this framework offers a joint order commitment process at multiple horizons leading to an order or series of orders that span over a time horizon. This also extends the replenishment process beyond the buyer’s DC and seller’s finished goods warehouse to encompass all the nodes in the supply chain.

Store Replenishment Collaboration: As with DC Replenishment, conventional store replenishment programs include a single trading partner over a given time horizon. This scenario capitalizes on the insights of both the retailer and manufacturer to deliver optimized replenishments. Partners collaborate on POS forecasts and other factors like Store clustering, Replenishment parameters and Assortment optimization. This collaboration is focused on the store which is the supply chain’s interface with consumer and hence directly influences shelf availability. Key benefits of this framework deployment include greater visibility to consumer take-away, improved replenishment accuracy, improved in-stocks, overstock reduction and improved promotional execution.

Collaborative Assortment Planning: This scenario is applicable for industries where product lifecycle is short and demand pattern follow a seasonal rhythm such as fashion apparel and accessories. Due to such product characteristics there is minimal discrete historical data to utilize in the planning cycle and so importance is laid upon collaborative research of market trends, customer tastes and other business affecting factors.

All partners jointly develop an assortment plan containing product visuals and financials, which leads to a planned purchase order at the style/colour/size granularity for each retailer stock point. Then sample products are shown to the buyer and sellers during road shows and previously made purchase order numbers are finalized.
Successful CPFR implementations require robust software applications that can work quickly with a large number of demand points (e.g. retail outlets), vendors and SKUs. The applications should also have capability to perform complex data analytics like data aggregations along multiple dimensions.

Motorola implemented CPFR in 2001 at its Mobile Devices division to tackle high forecast error, excessive stock-outs and to gain visibility of outward shipments from the retailers’ DCs instead of visibility to only the inwards into the DCs. Upon rolling out the initiative, stock-outs became a third of earlier levels; inventory reduced by 30% for its CPFR enabled retailers and transportation costs reduced by half due to better load consolidation and planning. Asset utilization also improved since Motorola could now plan optimal production runs and dispatch full containers, mostly driven by reduced variability.

Though the CPFR method represents a drastic shift from the traditional silo based transactional relationship between various functions, internal and external, tremendous value can be created by working together towards the same forecast numbers. The VICS committee has documented results of numerous pilot projects. These include up to 40% improvements in forecast accuracy, significant increases in customer service, up to 60% lift in sales and inventory reductions between 15% - 20%. Some early adopters of this model are Wal-Mart, P&G, Unilever, Heineken, Henkel and Gillette.

CONCURRENT ENGINEERING

Product Design and Development is one of the most effective tools for an organization to differentiate itself from its competitors. A continuous stream of new products and processes that best suit the customer requirements and are manufactured in a way that is difficult for the competitors to emulate with comparable cost and quality; can help a firm build enormous competitive advantage.

APICS defines concurrent engineering as “A concept that refers to the participation of all the functional areas of the firm the product design activity including the suppliers and customers with the intent to enhance the design with the inputs of all the key stakeholders so that a product can be quickly brought to the marketplace while maximizing quality and minimizing costs”.

Concurrent Engineering was the answer to the lack of integration between the different stakeholders of the product design and development process. The idea was to get all of them together under one roof to get the expertise and perspective of all of them together, continuously and at real time.
Marketing team would give inputs on the customer needs and wants, process design and operations would bring the perspective of designing to support easy manufacturability, suppliers would bring in the knowledge of raw materials and components that can be used best or any alternatives that would be more effective and the product and process design team would bring in their core experience of design.

Real life experiences of Concurrent Engineering have resulted in reduced design times, lower costs, simplified complex processes and procedures. As very short product life cycle times are the order of the day, concurrent engineering model for product development has become indispensable. A leading Indian auto OEM has very effectively used concurrent engineering to develop a product that would be very difficult for any competitor around the world to emulate.

**EXTENDED ERP**

The three elements discussed above though very effective individually are indeed transformational when working together and with external business partners. It is critical that these elements and every other business process are pillared on a rock solid IT application infrastructure. In the last few decades businesses world over have implemented ERP solutions, and a vast majority of them have realized the benefits – enhanced visibility, standardized procedures, accountability and departmental automation – that such solutions promised. But businesses evolved, and no longer could enterprises be concerned just about what happens within their four walls. Virtually every firm today is either operating in other countries, or using parts or materials that are produced elsewhere or by other firms. When businesses are so dependent of other firms it presents a new set of challenges on way to running operations smoothly and efficiently. And here is where traditional ERP were found lacking in connecting across organizational boundaries and paved the way for Extended ERP (or ERP II). The changed business scenario necessitated a move away from department-centric optimization and transactional processing focus to a new mandate for process integration, cross functional optimization and external collaboration.

Major ERP solutions have evolved keeping in mind the above needs and today they enable real-time collaboration with partners, suppliers and customers and have advanced point applications that were earlier offered only by best of breed solutions. These applications include supply chain management (SCM), supplier relationship management (SRM), customer relationship management (CRM), product life-cycle management (PLM) and many more. These applications have optimization capabilities that build upon the existing benefits of ERP and the overall technical architecture also enables inter and intra enterprise collaboration in various operational functions such as sales, forecasting, planning and scheduling, product development, logistics and more.
Extended ERP addresses one of the biggest issues that firms have faced making their ERP work seamlessly with their other best of breed point applications, namely real time and effective integration. Having the entire IT application set catering to all business functions on a common platform working on a centralized database cuts down IT integration development and maintenance and ensures synchronization between applications vital for collaboration. Where ERP was originally positioned for manufacturing, finance and distribution processes, Extended ERP will address every business in the enterprise and as discussed earlier has enabling technologies for external collaboration, with focus on complete value chain optimization.

Innovated Supply Planning

The fifth element is a synchronized supply planning processes, integrated at one end with its internal consumers, manufacturing and logistics, and at the other end, with all suppliers. Supply Planning consists of numerous initiatives such as Supplier Rationalization, Vendor Managed Inventory and Consignment Processing. While it is important to achieve optimal demand-supply matching at the downstream end of the supply chain as discussed under S&OP earlier, it is equally rewarding to have a similar demand-supply matching at other end too. In this case demand would be the requirements from manufacturing functions and supply would be external suppliers or internal component manufacturing units. Based on end customer demand signal, production plans and material requirements plans are firmed up. These material requirements usually partially filled up by existing inventory but the rest comes from fresh procurements. Supply Planning targets this function to achieve increased efficiencies and reduced costs.

**Supplier Rationalization:** More often than not, a firm may have more suppliers than it may actually need. As firms grow the number of suppliers also increase, usually because of diverse purchase requirements and lack of control over supplier approval process. Obviously during growth phase these aren’t areas that attract a lot of executive attention, but as operations stabilize supplier rationalization presents a good opportunity for cost reduction. This program targets to achieve an optimal supplier base for the firm based on its requirements and delivers benefits both from a financial and business process perspective. Some specific benefits include – increased spend leverage, reduced procurement overheads and better relationships with suppliers. On the flipside, this program can increase dependence on a smaller set of suppliers and may impact the competitiveness amongst suppliers.

**Vendor Managed Inventory:** It is a practice where inventory is managed by the vendor instead of the consuming party. This concept is based on the belief that vendors know the supply/production constraints better than the consumers for the supplied material and once the demand signal is shared with them, they will be able to
better manage the material flow. This arrangement also reduces the transactions in the entire flow since the consuming party is not concerned about material management at all. VMI takes collaboration among partners to a new level, where an outside party is still owns material in an enterprise and has complete visibility to its usage and consumption.

Though VMI can be beneficial across industries, it is extremely beneficial in industry segments where demand is unpredictable (pharma), fast moving short lifecycle products (consumer electronics) or small margins (automotive). Immediate benefits that accrue from VMI are: lower costs for all parties by reduced inventory, transport, obsolescence, stocktaking etc, smoother utilization levels at vendors by flexible delivery and insight into consumption, reduced overheads due to lesser paperwork, order entry tasks etc. Implementing VMI requires industry standard compliant IT systems that are capable of communicating across enterprise boundaries.

**Consignment Process:** This is another one of the models of supplier managed inventory. Also known as the Vendor Owned Inventory (VOI), Consignment Process involves the supplier physically giving the material to the customer at the time and point of use and until that point; supplier retains the cost of holding the inventory and its title. The customer is billed only after the usage of the material and the supplier then replenishes the inventory. This translates into huge benefit for the customer as he is able to show higher inventory turns on his sales though he still has to store and manage this inventory. While the benefit for a supplier may not be so clearly apparent, in reality this model helps the suppliers increase his sales for those products that has some sort of risk involved with it.

Products whose sales are questionable are most apt for following this managed inventory model. New products, expensive products or existing products in new sales channels have an associated sales risk attached to them. The customer might not be willing to buy this product and stock it in lieu of the risk involved. In such a scenario, a supplier might share the risk with the customer by storing the material at the customer location at this cost. As and when the product is used by the customer, the supplier gets paid for it and replenishes the inventory. This convinces the customer to buy this product thereby enabling the supplier to make a sale. Consignment Inventory is a complex model to follow and requires some agreement issues to be sorted out such as payment terms, insurance and loss ownerships, freight and return policies, data exchange and time limits.

For a supplier, it is advisable to go for a consignment process only if the demand in unstable and highly variant or when there is a subtle risk involved in buying or storing the product. A customer might demand consignment inventory to reduce his costs but the supplier has to carefully evaluate before deciding on it. It is a result of a collaborative relationship between the buyer and seller and is successful only in scenarios where it offers shared benefits to the stakeholders. Some of the downsides of this model is its difficulty of execution, requirement of highly advanced technology and complex data requirement and increase in supply costs. Therefore, consignment process is advisable only when the benefits surpass the downsides.

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