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SUPPLY CHAIN MANAGEMENT



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SUPPLY CHAIN MANAGEMENT

S.Seenivasan

Companies on the growth path are very keen to implement supply chain management as a strategy to gain competitive advantage and improve on their bottom lines. However, even in advanced countries such as the US there has been a limited reach. This is attributable to the fact that all the factors have not been favorable to establish a complete supply chain. A framework to look at these factors in terms of Drivers, SCM Implementation process, Enablers, and Disablers

to achieve Outcomes is proposed.

INTRODUCTION:

Successful companies are responsive. They adapt to market changes quickly, remaining nimble in the face of continual economic evolution. Similarly, successful supply chains once relatively simple product and information pipeline are becoming more global and complex.

Supply Chain Management (SCM) has seen a lot of interest in both Manufacturing and service industries in recent years. As such it is very relevant to understand the definitions of SCM.

Monczka, Trent, and Handfield (1998) defined SCM as “an organizational concept whose primary objectives is to integrate and manage the sourcing, flow and control of materials using a total systems perspective across multiple functions and multiple tiers of suppliers”. They have said that “concept of managing supplier’s suppliers is often referred to as supply chain management”.

Ayers (2001) while quoting Joel Sutherland (1999, unpublished data) points to three different common views of the supply chain.

1. “Supply Chain” is just another term for “logistics”.
2. Supply chain includes other functions such as purchasing, engineering, production, finance, marketing, and other related control activities in the single company.
3. The supply chain is all the functions in definition #2 plus those in the company’s supplier’s and a company’s customers as well-extending far outside the traditional enterprise.

Ayers adds his own two cents worth with the following definition- “Supply Chain: Life cycle processes comprising physical, information, financial, and knowledge flows whose purpose is to satisfy end-user requirements with products and services from multiple linked suppliers.

In the Handbook of Supply Chain Management, Ayers (2001) defines SCM as “Design, maintenance, and operation of supply chain processes for satisfaction of end user needs”.

Chopra and Meindl, (2003) defines a supply chain as follows “A supply chain consists of all stages involved, directly or indirectly, in fulfilling a customer request. The supply chain not only includes the manufacturer and suppliers but also transporters, warehouses, retailers and customers themselves. Within each organization, such as a manufacturer, the supply chain include, all functions involved in filling a customer request. These functions include, but are not limited to, new product development, marketing, operations, distribution, and finance and customer service”.

For our purpose, we may define supply chain as “All activities from raw materials through various design and production stages which could take place in different organizations through various distribution stages to delivery to end customer including the bundle of service requirements for a manufactured product and the complete network of activities providing support of various organizations for the required final service to the end customer in the case of service.

Supply Chain Management is the coordination and integration of all the activities in the supply chain in order to gain a competitive advantage.

SCM and its related components:

Ø A supply chain is defined as a set of three or more companies directly linked by one or more of the upstream and downstream flows of products, services, finance, and information from a source to a customer.

Ø A basic supply chain consists of company, an immediate supplier, and an immediate customer directly linked by one or more of the upstream and downstream flows of products, services, finances, and information.

Ø An extended supply chain includes suppliers of the immediate supplier and customers of the immediate customer, all linked by one or more of the upstream and downstream flows of products, services, finances, and information.

Ø An ultimate supply chain includes all companies involved in all the upstream and downstream flows of products, services, finances, and information from the initial supplier to the ultimate customer.

Ø A supply chain orientation is the recognition by a company of the systemic, strategic implications of the activities and processes involved in managing the various flows in a supply chain.

Ø Supply chain management is the implementation of a supply chain orientation across suppliers and customers.

Ø Supply chain management is the systemic coordination of the traditional business function within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole.

Global Supply Chain Business Process:**Strategy**

- § Supply chain strategies in support of corporate strategies
- § Achieving efficiency in current activities through economies of scope and scale
- § Managing risks associated with current activities
- § Developing learning capabilities to enable innovation and adaptation to environmental changes
- § Balancing local responsiveness/global efficiency

Risk management

- § Environmental scanning and operating flexibility
 - o Monitoring and adapting to changes in the macroeconomic environment (wage and interest rates, exchange rate)
 - o Monitoring and adapting to changes in government policy (taxes, duties, legal requirements, technical, standards, local content requirements)
- § Understanding and planning for behavior of global competitors with differences in industry structure and legal requirements.
- § Understanding, planning for, and managing resource capability in multiple countries and cultures.

Knowledge management

- § Developing organizational processes that allow for innovation, learning, and adaptation across countries and cultures
- § Protecting proprietary technology.

Relationship management

- § Structuring relationships that enable the firm to meet strategic objectives and manage risk.
- § Understanding the implications of culture in ,managing relationship with customers and supplier.
(e.g., difference in customer requirements, difference in perceptions and responsive behaviors)
- § Structuring relationships to meet strategic objectives while managing risk and to meet legal requirements in multiple countries.
- § Understanding and managing geographic, social, and cultural asymmetry.
- § Understanding the implications of culture in negotiations.

Financial management

- § Understanding differences in financial accounting systems and comparability of cost data.
- § Managing terms of sale and ownership exchange to minimize risk and optimize profitability.
- § Optimizing transfer pricing to minimize taxes and duties.
- § Developing systems and processes to manage counter trade and foreign exchange.

Organizational capability

- § New skill sets required (knowledge of language, customers, exchange rates, opportunities in foreign markets, foreign logistics)
- § Understanding and managing differences in mind-set resulting from historical business practices (e.g., inventory is food is periods of inflation)
- § Understanding cultural implication on motivation, developing appropriate reward and recognition systems

Information management and technology

- § Developing compatible information technologies on a global basis
- § Standardization of operating systems
- § Developing decision support tools that consider global variables, allow “what if” scenario analysis, and enhance decision making
- § Developing information systems that allow access to and utilization of global data for supply chain strategy and operations
- § Managing information flows associated with cross-border movements
- § Compatibility of data and information system

LITERATURE SURVEY:

Chopra and Meindl (2003) introduce four drivers -inventory, transportation, facilities, and information – that determine the performance of any supply chain in

terms of responsiveness and efficiency. The drivers according to them are

1. Inventory- because inventory policies can affect alter the supply chain's efficiency and responsiveness. Inventory is raw materials, work- in-process, and finished goods across a supply chain.
2. Transportation- because transportation choices have a large impact on supply chain responsiveness and efficiency.
3. Facility- decisions regarding location, capacity and flexibility of facilities have a significant impact on supply chain performance. Facilities are the places in the supply chain network where inventory is stored, assembled or fabricated.
4. Information- affects each of the drivers. Information consists of data and analysis regarding inventory, transportation, facilities, and customers throughout the supply chain.

Components of SCM:

The following are five basic components of SCM.

Plan:

This is the strategic portion of SCM. You need a strategy for managing all the resources that go towards meeting customer demand for your product or service. A big piece of planning is developing a set of metrics to monitor the supply chain so that it is efficient, costs less and delivers high quality and value to customers.

Source:

Choose the suppliers that will deliver the goods and services you need to create your product. Develop a set of pricing, delivery and payment processes with suppliers and create metrics for monitoring and improving the relationship. And put together processes for managing the inventory of goods and services you receive from suppliers, including receiving shipment, verifying them, transferring them to your manufacturing facilities and authorizing supplier payment.

Make:

This is the manufacturing step. Schedule the activities necessary for production, testing, packaging and preparation for delivery. As the most metric-intensive portion of the supply chain, measure quality levels, production output and worker productivity.

Deliver:

This is the part that many insiders refer to as logistics. Coordinate the receipt of orders from customers, develop a network of warehouse, pick carriers to get products to customers and set up an invoicing system to receive payments.

Return:

The problem part of the supply chain. Create a network for receiving defective and excess products back from customers and supporting customers who have problems with delivered products.

Supply chain management must address the following problems:

Distribution network configuration: Number and location of suppliers, production facilities, distribution centers, warehouses and customers.

Distribution strategy: Centralized versus decentralized, direct shipment, cross

docking, pull of push strategies, third party logistics.

Information: Integrate systems and processes through the supply chain to share valuable information, including demand signals, forecasts, inventory and transportation.

Inventory management: Quantity and location of inventory including raw materials, work-in-process and finished goods.

CHOPRA AND MEINDL (2003), IDIB, also define the obstacles to achieving strategic fit:

1. Increasing Variety of products.
2. Decreasing Product Life Cycles.
3. Increasingly Demanding Customers.
4. Fragmentation of Supply Chain Ownership.
5. Globalization.

THE KEY FINDING BASED ON A SURVEY IN US BY TAN (2002), ACROSS INDUSTRIES ARE

1. An integrated supply chain requires a total commitment by all members of the chain.
2. The purchaser needs to worry about the supplier passing trade secrets to competitors. Also the supplier may venture out on his own, using the company's information.
3. Conflicting objectives and missions among supply chain members could be a major issue.

PARK AND HARTELY (2002) in their study on the effect of supplier management, studied Korean industries and their findings are summarized as follows:

1. Long-term relationships, reducing supplier base, and focusing on quality when selecting suppliers are important with tier II suppliers.
2. The findings show that performance of second-tier suppliers significantly affects the quality and delivery of first-tier suppliers.

A comprehensive review of various published material comprising Chandra and Sastry (1998), Sahay et al.(2003), Tan (2002), Handfield R B (1994), Kaufmann and carter(2002), Ellram et al.(2002), Elmuti(2002), Park and Hartely(2002), Basnet et al. (2003), Msimangira (2003) done by Lakshminarasimha(2004) reveals that:

1. Supply chain management has been implemented to different degrees in different countries.
2. Excellent coordination between the members is a prerequisite for the implementation of Supply Chain Management practices.
3. There should be a mutual trusting mindset between all the supply chain partners.
4. The obstacles towards the implementation of supply chain management are

different in different situations.

Looking at this process

A supply chain network is developed link by link. Every manufacturing or trading company builds itself up in stages. Each industrial customer intermediary requires to be developed, whereas each customer has to be worked on through marketing strategies. Each supplier is located, developed and a link established. Each link will be designed based on the proposed framework. Definitions of terms used in the above framework:

Drivers:

Forces which determine the supply chain link performance, and are used in design, planning and operation of supply chain with the overall goal of SCM in mind.

Enablers:

Facilitators to the drivers in achieving SCM goals.

Disablers:

These are elements in the organizations at the link and at the interface which create hurdles in forming an effective linkage from the supply chain perspective.

SCM implementation process:

The process adopted by the interface organizations to ensure that the linkage is operational and the maintenance process put in place to ensure compliance of linkage efficacy.

Outcomes:

These are defined in terms of responsiveness as defined by end customer's changing needs or efficiency in terms of costs which would impact the overall cost to the end customer.

Sense-and-respond supply chains:

Some companies are shift in towards sense-and-respond supply chain strategies. Sense-and- respond supply chains can monitor, manage and optimize business exceptions-anomalous events that occur within supply chains-with a limited need for human intervention. They can provide event assessment and optimize supply chain performance between planning and execution, based on real-time information. Ultimately they allow businesses to remain nimble and responsive to shifting demand. And in a proactive business environment, sense-and-respond supply chains can be used to influence market demand.

IBM recently conducted an extensive survey to discover the greatest concerns of cross-industry CEOs. Heading the list is top line growth and profitability, followed by responsiveness. The third most important issue to CEOs is building and retaining an effective workforce indicating a renewed focus on skills and decision-making support.

CEOs in the study recognize that their organizations need to sense, analyses and respond much more effectively and quickly to market fluctuations. They're concerned with instituting customer-responsive methodologies. However, few of

them believe that their organizations are able to reach with sufficient speed and agility to changing conditions and supply chain events. In fact, 80% rated their organizations as being “less than capable” of responding adequately. Executives recognize the need to establish effective and proactive real-time responses to evolving market conditions and daily supply and demand shifts. To do so and to achieve their business objectives, they’re focusing on supply chain responsiveness initiatives and adopting advanced practices in four focus areas, as shown figure.

Conditioning market demand with sense-and-respond supply chains:

When companies can move away from reacting to market conditions in to a more proactive stance, they create a sharp competitive edge. Sense-and-respond supply chain can enable market conditioning through trend analysis and supply and demand information. The personal computing Division of IBM uses order trends and actual demand to provide early warnings of constraints and excesses. This early warning result in the company’s ability to position itself to condition demand for existing and planned supply.

The system identifies forecasting events and order events. This provides early warning for demand conditioning. It can correlate and analyze the information and detect early insight in to supply constraints and excess. It will then alert the appropriate parties of exceptions and recommend actions.

Based this information, sales teaks adjust selling tactics and supply teams rebalance supplies. The core team is collaborative, composed of members from marketing, operations, procurement, finance and development. They identify supply imbalances, create a conditioning plan in partnership with the geography sales organizations and manage the plan’s execution.

Supply chain management software:

Supply chain management software is possibly the most fractured group of software applications on the planet. Each of the five major supply chain steps previously outlined composes dozens of specific tasks, many of which have their own specific software. Some vendors have assembled many of these different chunks of software together under a single roof, but no one has a complete package that is right for every company. For example, most companies need to track demand, supply, manufacturing status, logistics (i.e. where things are in the supply chain), and distribution. They also need to share data with supply chain partners at an ever increasing rate. While products from large ERP vendors like SAP’s advanced planner and optimizer (APO) can perform many or all of these tasks, because each industry’s supply chain has a unique set of challenges, many companies decide to go with targeted best of breed products instead, even in some integration is an inevitable consequence.

It’s worth mentioning that the old adage about system only being as good as the information that they contain applies doubly to SCM. If the information entered in to a demand forecasting application is not accurate then you will get an inaccurate forecast. Similarly, in employees bypass the supply chain systems and try to manage things manually, then even the most expensive systems will provide an incomplete picture of what is happening in a company’s supply chain.

Relationship between ERP and SCM:

Many SCM applications are reliant upon the kind of information that is stored in the most quantity inside ERP software. Theoretically you could assemble the information you need to feed the SCM applications from legacy system (for most companies this means excel spreadsheets spread out all over the place), but it can be nightmarish to try to get that information flowing on a fast, reliable basis from all the areas of the company. ERP is the battering ram that integrates all that information together in a single application, and SCM applications benefits from having a single major source to go to for up-to-date information. Most CIOs who have tried to install SCM applications say they are glad they did ERP first. They call the ERP projects "putting your information house in order." Of course, ERP is expensive and difficult, so you may want to explore ways to feed your SCM applications the information they need without doing ERP projects may be a way to kill two birds with one stone. Companies will need to decide if these products meet their needs or if they need a more specialized system.

Application that simply automate the logistics aspects of SCM are less dependent upon gathering information from around the company, so they tend to be independent of the ERP decision. But chances are, you'll need to have these applications communicate with ERP in some fashion. It's important to pay attention to the software's ability to integrate with the internet and with ERP applications because the internet will drive demand for integrated information. For example if you want to build a private website for communicating with your customers and suppliers, you will want to pull information from ERP and supply chain applications together to present update information about orders, payments, manufacturing status and delivery.

Goal of installing supply chain management software:

Before the Internet came along, the aspirations of supply chain software devotees were limited to improving their ability to predict demand from customers and make their own supply chains run more smoothly. But the cheap, ubiquitous nature of the Internet, along with its simple, universally accepted communication standards have thrown things wide open.

Now, you can connect your supply chain with the supply chains of your suppliers and customers together in a single vast network that optimizes costs and opportunities for everyone involved. This was the reason for the B2B explosion; the idea that everyone you do business with could be connected together into one big happy, cooperative family.

Of course, reality isn't quite that happy and cooperative, but today most companies share at least some data with their supply chain partners. The goal of these projects is greater supply chain visibility. The supply chain in most industries is like a big card game. The players don't want to show their cards because they don't trust anyone else with the information. But if they showed their hands they could all benefit. Suppliers wouldn't have to guess how many raw materials to order, and manufacturers wouldn't have to order more than they need from suppliers to make sure they have enough on hand if demand for their products unexpectedly goes up. And retailers would have fewer empty shelves if they shared the information they had about sales of a manufacturer's product in all their stores with the manufacturer. The Internet makes showing your hand to others possible, but centuries of distrust and lack of coordination within industries make it difficult.

Over the last few years most companies have gotten over the trust issue. In many cases "gotten over" is a euphemism for "have been bullied into sharing supply chain information from a dominant industry player." Want to sell your goods in

Wal-Mart? Better be prepared to share data.

The payoff of timely and accurate supply chain information is the ability to make or ship only as much of a product as there is a market for. This is the practice known as just-in-time manufacturing, and it allows companies to reduce the amount of inventory that they keep. This can cut costs substantially, since you no longer need to pay to produce and store excess goods.

Supply chain collaboration:

Let's look at consumer-packaged goods for an example of collaboration. If there are two companies that have made supply chain a household word, they are Wal-Mart and Procter & Gamble. Before these two companies started collaborating back in the '80s, retailers shared very little information with manufacturers. But then the two giants built a software system that hooked P&GOWTHAM up to Wal-Mart's distribution centers. When P&GOWTHAM's products run low at the distribution centers, the system sends an automatic alert to P&GOWTHAM to ship more products. In some cases, the system goes all the way to the individual Wal-Mart store. It lets P&GOWTHAM monitor the shelves through real-time satellite link-ups that send messages to the factory whenever a P&GOWTHAM item swoops past a scanner at the register.

With this kind of minute-to-minute information, P&GOWTHAM knows when to make, ship and display more products at the Wal-Mart stores. No need to keep products piled up in warehouses awaiting Wal-Mart's call. Invoicing and payments happen automatically too. The system saves P&GOWTHAM so much in time, reduced inventory and lower order-processing costs that it can afford to give Wal-Mart "low, everyday prices" without putting itself out of business.

Roadblocks to installing supply chain software:

Gaining trust from your suppliers and partners.

Supply chain automation is uniquely difficult because its complexity extends beyond your company's walls. Your people will need to change the way they work and so will the people from each supplier that you add to your network. Only the largest and most powerful manufacturers can force such radical changes down suppliers' throats. Most companies have to sell outsiders on the system. Moreover, your goals in installing the system may be threatening to those suppliers, to say the least. For example, Wal-Mart's collaboration with P&G meant that P&G would assume more responsibility for inventory management, something retailers have traditionally done on their own. Wal-Mart had the clout to demand this from P&G, but it also gave P&G something in return-better information about Wal-Mart's product demand, which helped P&G manufacture its products more efficiently. To get your supply chain partners to agree to collaborate with you, you have to be willing to compromise and help them achieve their own goals.

Internal resistance to change.

If selling supply chain systems is difficult on the outside, it isn't much easier inside. Operations people are accustomed to dealing with phone calls, faxes and hunches scrawled on paper, and will most likely want to keep it that way. If you can't convince people that using the software will be worth their time, they will easily find ways to work around it. You cannot disconnect the telephones and fax machines just because you have supply chain software in place.

Many mistakes at first.

There is a diabolical twist to the quest for supply chain software acceptance among your employees. New supply chain systems process data as they are programmed to do, but the technology cannot absorb a company's history and processes in the first few months after an implementation. Forecasters and planners need to understand that the first bits of information they get from a system might need some tweaking. If they are not warned about the system's initial naiveté, they will think it is useless. In one case, just before a large automotive industry supplier installed a new supply chain forecasting application to predict demand for a product, an automaker put in an order for an unusually large number of units. The system responded by predicting huge demand for the product based largely on one unusual order. Blindly following the system's numbers could have led to inaccurate orders for materials being sent to suppliers within the chain. The company caught the problem but only after a demand forecaster threw out the system's numbers and used his own. That created another problem: Forecasters stopped trusting the system and worked strictly with their own data. The supplier had to fine-tune the system itself, then work on reestablishing employees' confidence. Once employees understood that they would be merging their expertise with the system's increasing accuracy, they began to accept and use the new technology.

Extended supply chain

The extended supply chain is a clever way of describing everyone who contributes to a product. So if you make text books, then your extended supply chain would include the factories where the books are printed and bound, but also the company that sells you the paper, the mill where that supplier buys their stock, and so on. It is important to keep track of what is happening in your extended supply chain because with a supplier or a supplier's supplier could end up having an impact on you (as the old saying goes, a chain is only as strong as its weakest link). For example, a fire in a paper mill might cause the textbook manufacturer's paper supplier to run out of inventory. If the textbook company knows what is happening in its extended supply chain it can find another paper vendor.

Impact of supply chain with globalization:

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Some emerging trends in Supply Chain:

RFID (Radio Frequency Identification):

Many global organizations' supply chains depend on over-ocean shipping. However, over-ocean shipping has hot involved much of the management attention

leading to highly inefficient, nontransparent and risky supply chain operations. Key concerns in managing over-ocean supply chains solution using radio frequency identification (RFID) technology for tracking and security.

Optimizing Supply Chain Performance

Sense-and-respond strategies and capabilities can be used to optimize supply chain performance and offer many benefits that can result directly in both quantitative and qualitative value. For example, constituents can see integrated information and processes, allowing for rapid decision-making and corrective action before problems escalate. This end-to-end visibility also provides the opportunity to proactively identify and resolve problems like inventory gaps and possible out-of-stock issues. Bottlenecks and interruptions-such as a supplier's inability to fill an order prior to a cancellation date-can also be identified and resolved. And because it's easy to see current stock positions, in-transit stock and on-order status, inventory in the pipeline can be reduced.

When you standardize and align performance measure and targets, you can eliminate silos of performance excellence and meet overarching supply chain objectives. Sense-and-respond supply chains can provide continuous performance improvement through measurement, accountability and event notification of pending problems.

But the ultimate value of the sense-and-respond approach is supply chain responsiveness-the ability to quickly and effectively adapt to impending threats and opportunities, making company more nimble and more able to meet the demands of an ever-evolving marketplace.

RFID IN OVER-OCEAN SHIPPING

When a business traveler loses luggage in transit, it's an inconvenience. She may spend a day wearing rumpled clothes and have to take time for shopping. But when a major company loses key components in transit, it can stall manufacturing lines disrupt product deliveries, and impose an economic impact far greater than a quick trip to the store.

Today, most companies' supply chains increasingly rely on over-ocean shipping. Every day 20,000 containers enter ports in the United States-that's almost 14 containers per minute. Overseas shipping now accounts for more than 90% of worldwide trade with 95% of all US cargo passing through the nation's 361 ports.

So while manufacturers cut costs by producing goods in offshore facilities, frequently with no loss of quality, they can suffer when it comes to shipping these items. The tangle of containers, ports, carriers, and customs and border security checkpoints confounds the goals of simplicity and transparency in the supply chain.

The relative importance of the top 10 management issues in the over-ocean supply chain. Ensuring container security leads the list, reflecting the difficulties of doing business in a post-9/11 world. For example, one chemical executive says that for certain import and export products, his company is willing to do "whatever it takes to guarantee container security".

posted by seenivasan @ 2:22 AM

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