

Supply Chain Management

Creating Linkages for Faster Business Turnaround

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Preface

Welcome to the first edition of Supply Chain Management, a resource compiled and created to provide you with all the information necessary to get updated on this emerging area of management practice.

Supply Chain Management (SCM) is one revolution that has the capacity to challenge all the norms and practices industries and businesses followed so far. From strategy to operations, from internal operations to external operations, from the manner in which information is managed to the manner in which decisions are made – SCM has touched each area of business. From Automotive to FMCG, from Pharmaceutical to Chemical – SCM has brought in revolution in each sector.

This has generated tremendous curiosity and desire to know more and more about SCM. However there is a paucity of books on SCM by Indian authors and especially the ones that provide practical aspects and experiences of SCM implementation process. SCM cannot be properly understood or appreciated only in a theoretical context or framework. This book aims to provide detailed information on the ways and means in which SCM is viewed and implemented in various Indian companies.

The book has a vision to become the starting point for fuelling all ambitions to seek knowledge on SCM. We want this book to be a practical resource for all doubts and problems related to SCM.

FEEDBACK

A lot of effort has gone into putting this book together. We however apologize for glitches, misses if any. We would hence appreciate your feedback.

BOOK ORGANISATION

The SCM book has been created at two levels:

- 1) **Conceptual Level:** This covers information on the basic tools and philosophies of SCM in an easy to understand manner.
- 2) **Practical Level:** SCM is an operationally intensive area and hence any resource that does not talk about how SCM is actually implemented or used is incomplete. This book covers six case studies from some of the leading companies of India who are pioneers in adapting SCM practices. Each of the case study covers the challenges faced by these companies while implementing SCM. The problems they encountered and the solutions they found, the issues and opportunities, we have made an attempt to cover all of this. We hope you find the case studies interesting and encouraging.

Criterion for selecting the companies:

The companies covered in the case studies have been chosen after a lot of deliberation. The following questions were mulled:

- 1) Is SCM the focus and key area? Is the top management involved in SCM implementation?
- 2) Are the companies operationally intensive (they handle large number of raw materials, finished goods)? Because experience shows that the more operationally intensive the company, the more the learning from their practices.
- 3) Do they operate in a highly competitive or stressful market? Because we were convinced that the more competitive market they operate in, more will be the opportunities for SCM.
- 4) Have they demonstrated or calibrated SCM benefits and are willing and keen to share this success story with the world?

Snapshot of Case Studies covered in the Book

M&M (Mahindra & Mahindra) has time and again proved its capability to adopt best practices thereby beat the competition. The amount of work

Automotive Sector of M&M has done in vendor relationship is astounding and worth emulating. Similarly, GCMMF (Gujarat Cooperative Milk Marketing Federation) or AMUL, as it is more fondly known as, operate in a very peculiar market where both the raw material (milk) and the finished product (milk products) are perishable in nature. Also the cooperative culture that encourages micro entrepreneurship among farmers is highly creditable. Innovation is the key in AMUL. And it is because of such innovative culture that encourage adaptation of best practices, AMUL has become one of the most respected companies in India. Marico Industries Limited (MIL) can be credited as one of the fastest growing companies in India. In just 14 years (MIL started operations in 1990) it has an overwhelming presence in the high pressure FMCG (Fast Moving Consumer Goods) sector. High pressure because, customer revolution has most hit the FMCG sector and with large number of branded and un branded players it is highly competitive as well. And in such circumstances, the achievements of Marico are commendable. Asian Paints is another giant, who by its pioneering practices in SCM, in reliability management have dwarfed everybody else. Operating in a seasonal market brings with it different challenges and problems. But, for Asian Paints, creativity is the key to overcome such situations and market characteristics. Their approach to problems and issues, the methods they have adopted to overcome such issues and the manner in which SCM has been implemented are worth following.

The book is organized in thirteen chapters, each of which represents a facet of SCM.

Chapter One, SCM concepts: Covers the basic fundamentals that prepare the groundwork for take-off. Definition of SCM, constituents of SCM, types of SCM, process for implementing SCM, IT applications in SCM etc., are some of the key take aways.

Chapter Two, SCM in the corporate context: Importance of SCM for businesses, evolution of the theory and philosophy of SCM, overview of the various thinkers and management gurus who have contributed towards the development of thinking on SCM etc are some of the topics covered in this chapter.

Chapter Three, Achieving excellence in SCM: SCM excellence, various dimensions of SCM excellence, checklist for excellence etc., are some of the features of this chapter.

Case Study on FES (Farm Equipment Sector) of M&M has been covered here.

Chapter Four, Innovative SCM: This chapter harps on the importance of innovation in achieving success. Innovation in SCM and various aspects of this innovation has been covered here.

A Case Study on (GCMMF) Amul has been covered here.

Chapter Five, Customer focused SCM: Customer revolution and its effect on SCM, concept of demand chain and emergence of value chain Customer Relationship Management (CRM) and its integration with SCM are some of the topics discussed in this chapter.

Case Study on Asian Paints India Limited and their customer facing SCM practices have been covered along with this chapter.

Chapter Six, Retail SCM: Issues in Retail SCM, Bar Code technology and its role in Retail SCM, Types of Retailers, Product Life Cycle Management and the concepts like mass customization, de-verticalisation etc are the key take aways.

The Marico case study accompanies this chapter.

Chapter Seven, Vendor Partnerships: Changing supplier management practices, supplier development, key supplier account management, supplier performance measurement etc have been covered in this chapter.

A Case Study on M&M Automotive Sector has been covered here.

Chapter Eight, Reliability and Quality Management: Reliability Engineering and its advantages, Total Preventive Maintenance etc are some of the key take aways of this chapter.

A Case Study on Asian Paints with a focus on its Reliability Management program has been covered with this chapter.

Chapter Nine: Information Technology for SCM: This chapter focuses on topics such as Bull whip effect, Business Process Re-engineering, Enterprise Resource Planning, Internet and its application in SCM etc.

An Annexure on Emerging technologies of Electronic Commerce and its impact on SCM in particular and Business in general accompanies this chapter.

Chapter Ten: E Purchasing for SCM: E Sourcing, Implementing E Sourcing, E Procurement and the various tools of E Procurement are covered here.

An annexure that demonstrates E procurement opportunity has been provided along with this chapter.

Chapter Eleven: Logistics Management: History and Evolution of Logistics Management, Framework of Logistics Management, Elements of Logistics Management, Information Technology in Logistics Management are some of the key take aways.

A Paper on Services provided by Logistics Providers accompanies this chapter.

Chapter Twelve, Outsourcing in SCM: Background on Outsourcing and opportunities for outsourcing in SCM have been covered in this chapter.

Chapter Thirteen, Performance Measurement in SCM: Advantages of performance measurement, measuring suppliers, measuring self etc are some of the topics covered in this chapter.

Acknowledgements

This book was a mammoth task and would not have been possible without the support and encouragement from a lot of people. Our families in particular deserve special thanks.

Indian Institute of Materials Management (IIMM), Mumbai Branch for providing a platform where we met and interacted with all the wonderful people who have been instrumental in re designing the processes and hence shape of the industry.

International Federation of Purchasing and Materials Management (IFPMM) and its President Mr Richard Moras for bringing the prestigious Winter School to India and to Mumbai. Winter School brings together researchers and practitioners in the area of SCM from various countries of the world on a single platform to discuss the trends and developments in the area of SCM. It was during this winter school the need for a Book on SCM that covers some of the Best Practices from Indian Industry was felt.

V. Deepa from Tata Mc Graw Hill for her unflinching support and for the confidence she had in us. Her constant feedback was extremely encouraging.

Jonathan Mapgoankar and Satish Moorani from M&M, S. S. Kini, Soren Malekar, Vikram Jaisinghani and Jason D Souza from Asian Paints, Vinod Kamath and Pradeep Mansukhani from Marico and HP Rathod and Sanjay Panigrahi from GCMMF for agreeing to participate in the Case Studies. Their cooperation was extremely vital for completion of this book.

Puneet Ahua and Nachiket Gavaskar from Decision Craft Analytics for providing the CD that accompanies this book in a record time. CD contains an SCM Simulator which we are sure will be helpful to our readers.

Last but not the least, we wish to thank all of you for buying this book. We hope you will find this book helpful, useful and informative. We will look forward to your feedback (Sarika100@vsnl.net) to fill in the oversights in the next edition.

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Introduction to Supply Chain Management

SUPPLY CHAIN MANAGEMENT

Supply chain management (SCM) has dominated our lives, our thinking and our actions for almost half a decade now. Industry and academicians have spent several man years in understanding and researching the intricacies of SCM. From logistics to materials management to SCM, the evolution has been slow and steady. The decade of the '90s has been the most turbulent leading to large scale adoption of the concept of SCM. Shift in power from the manufacturer to the consumer, user-friendly technology, advent of the omnipresent Internet and economic deregulation leading to stiff competition are just some of the characteristics of this new age. This has also meant shifting of the onus of creating profit and wealth from the market (external environment outside the manufacturer's control) to inside the organization (within the manufacturer's control). The tools and techniques of SCM have come to the manufacturer's rescue. There are several stories of how companies have released locked in capital, thereby generating profits in-house by implementing SCM. The benefits are manifold and long term.

Implementing SCM is a long drawn process that necessitates restructuring of not only internal organizational activities but also demands a relook at the relationships the company shares with its suppliers, distributors and all others who participate

in the value creation process. The starting point, however, is a thorough understanding of what a supply chain is all about, the background, the thinking and the various bricks that the supply chain is made of. The following paragraphs trace the evolution of SCM.

HISTORICAL PERSPECTIVE

Following the Second World War, production outstripped demand, resulting in more marketing or selling problems than buying problems. Also, the World War emphasized the importance of reaching the right products at the right time in the right amount and of the right quality. If the soldiers could not get whatever they wanted at the right time, the consequences could be disastrous. If the enemy was right in front and the soldier started firing at him from his pistol, and if due to quality problems the pistol did not work at that instant, the less said about the outcome, the better. These requirements and the criticalities associated with them made the defence forces seriously analyze the supply system.

The supply system includes the process of planning, implementing and controlling the efficient, effective flow and storage of goods or services from the organization from its place of production to the place where it is required. This supply system was referred to as 'Logistics Management'. More succinctly, the military defined logistics as:

"... the science of planning and carrying out the movement and maintenance of forces... those aspects of military operations that deal with the design and development, acquisition, storage, movement, distribution, maintenance, evacuation and disposition of material; movement, evacuation, and hospitalization of personnel; acquisition of construction, maintenance, operation and disposition of facilities; and acquisition of furnishing of services."

This exhaustive definition takes care of the entire journey of the product from the cradle to the grave. This approach of taking a broader view of the supply system helped the defence forces in identifying and eliminating extra costs and extra inventory. The defence forces could streamline the working of their system. History has shown that logistics capabilities have helped countries win wars. In recent times, the victory of the US and allied forces in the Gulf War is a great example of how effectively logistics can contribute to empower the forces. And in

the past, the defeat of Napoleon and his Grande Armee of 600,000 men (the largest thus far in history) in Russia has been attributed to poor logistics. The then Czar of Russia, Alexander I Romanov was scared of Napoleon's Grande Armee and had remarked that "if Napoleon wages war against us, it is possible, even likely that he will beat us but we will leave it to our climate, our winter to wage a war against him." In the end, it was inadequate supplies to survive the rough Russian winter that drove Napoleon's forces to defeat and retreat. Hence, while it was important to make a detailed and foolproof war blueprint, it was equally important to support the forces with adequate food, shelter, clothing and machinery required to fight the war. It is a fact that due to logistics constraints, it took nearly five months after the Iraqi invasion of Kuwait for the allied forces to be fully ready to conduct operations. Logistics has always played a major role in the ability of armed forces to maintain a forward-deployed presence and project power. The Gulf War was won on a superbly and flawlessly designed logistics program that took into account the ground conditions and problems arising thereby.

LOGISTICS MANAGEMENT

The advantages of having a proper logistics management system in place were so immense that commercial organizations immediately jumped at the vast possibilities it offered. They also faced similar problems and situations as in a war and winning a customer or market share was equivalent to winning a war. Market share was a function of reaching the right product to the right customer at the right time. Commercial organizations started a logistics department with the responsibility of overseeing the journey of the finished product from its facilities to its retail outlets. The advantages were immediately realized. Almost all the commercial organizations jumped into the fray and soon logistics became a common buzz word in the commercial world as well.

However, the focus was always more on outbound logistics, i.e. the flow of finished goods from the manufacturing unit to the distributors, to the retailers and finally to the customers. Inbound logistics, i.e. the flow of basic materials, components etc., into the organization was ignored. One of the reasons was that traditionally, purchasing had been an isolated function in an organization and hence rarely attracted the desired attention. Hence, inbound logistics never got the same treatment as outbound logistics. Also, the belief that profits came from

the finished goods market and that the more finished goods sold, the thicker the bottomline, made organizations concentrate on the so-called right side. But trying to look good externally with the internal systems not in proper shape had its own repercussions.

CUSTOMER REVOLUTION

Those were the days of a passive customer who was not demanding and took what was offered. Customer had few options and just had to take what was available or wait till it was available. The manufacturer was the king and pushed his products onto the customer. Quality was a non-issue. Nobody even talked about it. Cases where the customer had to wait for as long as 8–10 years to buy a two-wheeler or four to five years for a four-wheeler were common. The prevalent joke was that if you wanted to buy a scooter for your son or daughter, you had to book as soon as they were born. This was a time when there were only two to three players in each category, i.e. very little or no competition. There were licences to be procured by manufacturers, a long and cumbersome process which discouraged entrepreneurship.

Suppliers and manufacturers had antagonistic relations and each one tried to squeeze the other. The negotiation table was akin to a battlefield. This had several repercussions. Both manufacturers and suppliers ended up having excess, idle and surplus inventory. Inventory management became a mammoth task for which a substantial portion of the budget had to be allocated. The extra cost got reflected in the minimum retail price and the customer also suffered in the process.

Globalization and change in Government policy saw more players enter the market, thus increasing competition. These new players brought with them not only sophisticated production and manufacturing techniques, but also most importantly, a customer-centred approach. Soon, the customer became king. He was offered more options, better quality and affordable prices at the time he desired. What Maruti did to the four-wheeler market and what Kinetic Honda did to a two-wheeler market was just that. These and many other companies also gave the customers something they never had; “options” to choose from. Customers were overwhelmed and used these options with a lot of vigour and eagerness. This resulted in shortening of the life cycle of the product. Customers became more

aware, more demanding and more aggressive. They demanded new things and got what they wanted as against what the manufacturer used to push on to them. This shook several manufacturers out of their complacency. With declining margins and stiff competition, emerged a manufacturer who was more responsive, more agile and more aware of the customer—his likes and dislikes. The manufacturers implemented the best logistical solutions, appointed the best of distributors and retailers and spent considerable effort and money on ensuring that a quality product reached the customer as soon as he demanded it. But alas! Many of them failed. Despite the best of systems, they had erred. These lapses made them introspect. The main problem identified was that of improper, irregular and inadequate supply of raw materials and all other components that go into manufacturing. This had made the manufacturers bulky and they suffered from the problems of excess inventory. This was due to lack of coordination with the suppliers with whom they had a hostile relationship. This resulted in a host of problems and consequences.

At long last, manufacturers realized that to be active on the customer's front, they would need the support of their suppliers. They could not win their customers at the cost of their suppliers. Those were also the days when various departments within the organization functioned in isolation and without coordination. In fact, they also treated each other with contempt. But the face off in the end user market started changing this attitude too. And they started seeking each other's cooperation in wooing the end user. The shortened product life cycle particularly meant that change in product design could only be harnessed by close strategic relations between customer and supplier. According to a McKinsey study, a product that was six months late to market would miss out on one-third of the potential profit over the product's lifetime. Purchase personnel, traditionally known as paper pushers, stormed into the limelight. Instead of considering it as a back door, organizations started looking at it as a window of the organization that infused fresh air into the manufacturing unit. A time had come to alter the old practices, as they would not necessarily succeed. Markets continually change, customers change, technology changes, competition also changes and each of these changes triggers a need to have a flexible and adaptable structure. To quote Michael Porter, the 'competitive strategy guru': *"the element of strategic purchasing as a vital component in the corporate planning process is aimed at gaining competitive advantage. Slowly but surely the importance of strategic supply management is coming out of its closet."*

Importance of Supply Chain

The world market is progressively becoming more challenging for marketers, producers and their suppliers with increased availability of world class, high quality products at costs which are low in both relative and absolute terms. With purchased content accounting in many organizations, of up to 70 per cent and more of the total cost of manufactured goods, the strategic significance of the supply management function has become a major determinant both of competitiveness in the market and corporate profitability. For wooing and winning the end user, companies need to take everybody associated together. It has to be a joint effort with all the players optimizing their performance. Suppliers, suppliers' suppliers, various functions within the organization, distributors, retailers and absolutely everybody who can contribute in whatever little way to grab that small inch of market share. This thought process has brought SCM into focus. A sound workable supply chain strategy has become the most important agenda of top management the world over. The competition is not between individual firms but between supply chains. And the supply chain that is faster and agile wins in the ultimate market. *Gartner predicts that by 2004, 90 per cent of enterprises that fail to apply supply chain management strategies to increase their agility will lose their status as preferred suppliers.* This will necessarily put a lot of pressure on companies to put a sound supply chain strategy in place.

DEFINING SCM

A supply chain includes all the processes that add customer-desired value to material and bring it to the customer. This value gets added at various stages of the journey that material takes till it reaches the customer. Supply chain encompasses all these value adding stages.

Supply chain literature is full of various definitions for supply chains. Given below are some of the famous SCM definitions:

- **MIT** official definition (Demystifying Supply Chain Management by Peter J. Metz from Supply Chain Management Review Winter 1998).

"Integrated Supply Chain Management (ISCM) is a process oriented, integrated approach to procuring, producing and delivering products and services to customers.

ISCM has a broad scope that includes sub suppliers, suppliers, internal operations, trade customers, retail customers and end users. It covers the management of materials, information and funds flows”.

- **Ganeshan and Harrison, Supply Chain Management**

“A supply chain is a network of facilities and distribution options that performs the functions of procurement of materials transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers.”

- **Ohio State University’s Global SCM Forum**

“the integration of business processes from end user through original suppliers, that provide products, services and information that add value for customers.”

- **Arizona State University**

A “supply chain” consists of all of the entities necessary to transform ideas into delivered products and services. Supply chain management directs and transforms a firm’s resources in order to design, purchase, produce, and deliver high-quality goods and services. As goods and services flow from supplier to producer to customer to final user, supply chain management is particularly concerned with the interfaces between organizations. One way to view supply chain management is as the management of linkages between organizations.

The competitive and global nature of today’s business environment dictates that this direction and transformation take place in a way that is as efficient and effective as possible. Continuing emphases on time, cost, and quality improvements have sharpened the need to coordinate and cooperate with trading partners around the world to achieve results that allow customers to be successful. Thus, supply chain management focuses on the integration of activities across several companies to manage the flow of products, services, people, equipment, facilities, and other resources. Supply chain management is also concerned with recycling, reuse, and final disposal of products.

- **Cisco**

“SCM aims to increase sales, reduce costs, and make full use of assets by streamlining the interaction and communication of all participants along the supply chain. SCM

solutions use networking technology to link suppliers, distributors, and business partners to better satisfy the end customer, while feeding real time data about customer demand into the partners' production and distribution processes."

Existence of so many definitions can be confusing and frightening. Several executives across companies often wonder whether they, their suppliers and their logistics providers are all reading the same book and same definition and whether they are all interpreting it the same way.

SUPPLY CHAIN TYPES

In the course of research and industry study the authors came across many definitions of supply chain and worse, several interpretations of supply chain. Based on the study, supply chains can be categorized as:

1. Raw Supply Chains.
2. Ripe Supply Chains.
3. Internal Supply Chains.
4. Extended Supply Chains.
5. Self-monitored Supply Chains.
6. Outsourced Supply Chains.
7. Production-Oriented Supply Chains.
8. Financial-Oriented Supply Chains.
9. Market-Oriented Supply Chains.
10. Value Chains (Complete Supply Chains).

Raw supply chains are the basic type that were loosely organized and mostly conformed to the legacy style. The departmental silos are still there but there is better coordination between them. This gave them better visibility into the

company's operations than before. This is called a supply chain as there is some improvement over the processes followed otherwise. These so-called supply chains are found in ancillary units and small scale industries.

Ripe supply chains are the ones where companies thought this was it and they have achieved all that there is to achieve. All the activities are done in an organized manner, companies have improved relationships with their suppliers and distributors and there was some amount of information flowing in through the chain. However, there are no other supply chain initiatives in the pipeline. These chains exist in the food sector.

Internal supply chains are the most commonly found where the companies have implemented sophisticated enterprise resource planning packages and their internal operations are absolutely fine tuned and well coordinated. However, they have not brought their suppliers or distributors into their fold. These companies are completely besotted by achieving internal optimization. The companies in this category are from all sectors and include all types of companies.

Extended supply chains are the internally optimized chains that extend well beyond the company's boundaries to include the suppliers and distributors into their fold. These companies, however, concentrate only on the top suppliers and the top distributors. In that sense there is a partial integration. Websites and specific web pages are used to communicate with external partners. However, complete integration wherein one Enterprise Resource Planning talks to the other and exchanges information smoothly without human intervention is missing. Once again this is a very commonly found supply chain spanning all sectors but specifically common in the automotive sector.

Self-monitored supply chains are the ones where the manufacturing company takes the lead in bringing all partners in its fold and hence these supply chains are company centric and not customer centric. Although they are able to achieve a considerable speed to market, it is not because of total optimization.

Outsourced supply chains are where the logistics partner (a 3 PL) usually takes care of everything—outbound logistics, inbound logistics, relationships, information flow, etc. They make decisions and they monitor the supply chain. This is very rare and is found to exist in some of the export houses. As there are only

activities such as procuring and exporting (no production) this is the most feasible alternative.

Production-oriented supply chains have a one point agenda: produce to optimize the capacity and labour. All other activities precede production. This is mostly found where low value items are made and sold through various channels. Hence, marketing and distribution are relatively the non issues.

Financial-oriented supply chain or more fondly known as “cash to cash cycle” chain provides a company with negative working capital (accounts receivables plus inventories less accounts payables). This leaves a company with high cash holding for use elsewhere. Goods flow quickly. Upon demand, they are converted or distributed and sold to customers who pay before the supplier’s accounts payable is settled. This chain emphasizes a financial goal first, and then logistics and planning are built from that end. This was found in big companies particularly in the fast moving consumer goods sector.

Market-oriented supply chains or customer supply chains are the typical built-to-order type of chains that get triggered when the customer places an order. Most commonly found in computer hardware sector, and other sectors which are dominated by consumer tastes, these supply chains are highly responsive and agile.

Value chains is the ultimate integration that is aimed at total optimization and not optimization in parts. These supply chains also addressed allied issues such as waste disposal, improving productivity, etc. Not very commonly found, but several companies have such ultimate supply chains on their agenda.

What is SCM?

Very simply put, SCM is a network of the manufacturer’s suppliers, and suppliers’ suppliers on the one hand and customers and customer’s customers on the other hand. This network exists to ensure a free and smooth flow of information, goods, services and profits among all its participants. Every node or link stands to gain from this association. In supply chain parlance each player is a supplier and supplies to the next player either basic raw materials, or components or semi-finished

products or the finished goods that manufacturer supplies to the distributor, who in turn supplies them to the retailer and who then supplies to the end user. It is an equivalent of a relay race where there are four players running one after the other. The first one hands the baton to the next, who then tries to maintain and even improves upon the performance of the earlier runner and passes on the benefits so derived to the next player and the process goes on till all the players have performed. The race cannot be won by best performance of any single player. It has to be a collective effort, a joint endeavour.

In Figure 1.1 all the nodes represent supplier nodes except the final node who is the end user. A manufacturer is also a supplier who manufactures the finished product in order to supply it to the distributor, who then supplies the product to

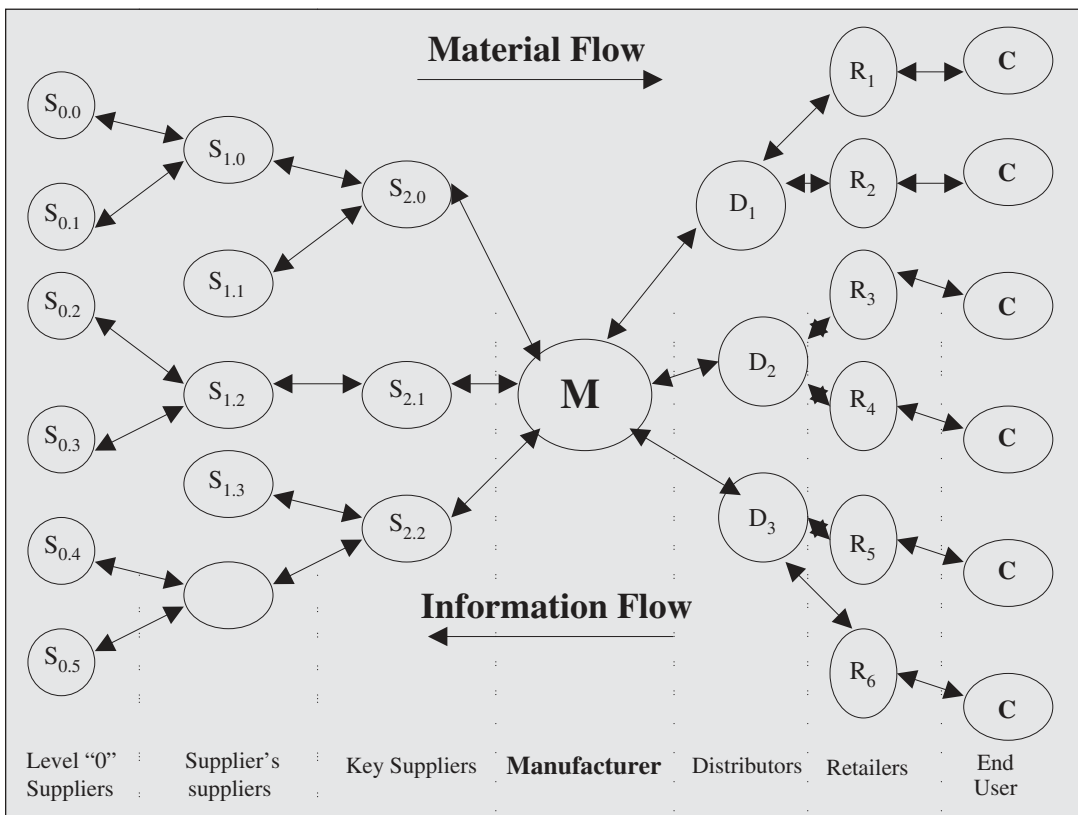


Figure 1.1 SCM Network

the retailer. The first set of nodes, i.e. Level “0” suppliers, represent the first tier of suppliers who are the basic material suppliers.

They supply to the second set of nodes (supplier’s supplier), which represent the second tier of suppliers. They add value to the basic materials procured from the first tier of suppliers and pass them on to the next nodes who are the key suppliers. These key suppliers add more value to the material procured by them and supply it to the manufacturer. He procures the different types of raw materials, components and manufactures the finished product that he is known for. He then supplies (he is also a supplier to the next set of nodes) the finished product to the next tier of supplier who is more popularly known as the distributor.

The next set of nodes, i.e. the distributor, supplies the finished products to the retailers. They add value by supplying the right product at the right time in the right quality to the retailer who is the buying arm of the customer.

A retailer exists to supply the finished product to the customer, the end user. He is the face of the manufacturer and as mentioned earlier, the buying arm of the customer. He is the first contact point with the customer and to a large extent responsible for sales volumes.

And finally there is the customer who buys a product for use. All the nodes and the entire supply chain exists for this customer. If the customer is happy with the product, service and quality it will show in the sales figures and profits.

That is the first step in obtaining a customer order, followed by production, storage and distribution of products and supplies to the customer site. Managing the chain of events in this process is known as supply chain management. Effective management must take into account coordinating all the different pieces of this chain as quickly as possible without losing quality or customer satisfaction, while still keeping costs down.

In addition, the key to the success of a supply chain is the speed with which these activities can be accomplished and the realization that customer needs and customer satisfaction are the very reasons for the network. Reduced inventories, lower operating costs, product availability and customer satisfaction are all benefits which grow out of effective supply chain management.

This is a hypothetical example and hence the supply chain looks simple and uncomplicated but in reality when the manufacturer typically buys thousands of products from hundreds of suppliers and distributes the finished product through another large set of distributors, things become quite intricate and complex. It is therefore very important to identify each and every node that constitutes the suppliers and make them participate in the information flow and smooth product flow. Even one small bit of information loss could lead to loss of sale. The situation becomes more complicated when the company makes and distributes several products and each product necessitates a detailing of its supply chain.

OBJECTIVES OF A SUPPLY CHAIN

The most important objective is unification of all the functions and activities that are required throughout the product life cycle from lust to dust. This unification or integration allows a smooth passage of information and products throughout the system. Managing the complete product life cycle includes managing the design, source, make and delivery. The principal objectives are:

- To reduce the physical supply chain links;
- To define supply chain responsibilities to a specific core service competency; and
- To decrease the time and cost of getting end user customer products in volume to markets worldwide.

ANALYSIS OF A SUPPLY CHAIN

Structuring the supply chain requires an understanding of the demand patterns, service level requirements, distance considerations, cost elements and other related factors. It is easy to see that these factors are highly variable in nature and this variability needs to be considered during the supply chain analysis process. Moreover, the interplay of these complex considerations could have a significant bearing on the outcome of the supply chain analysis process.

SUPPLY CHAIN CONSTITUENTS

These are the elements that are the backbone of SCM. These are the support structures on which the SCM rests and functions effectively.

The most important and vital element is **information**. All the activities within a supply chain get triggered with a single piece of information that the customer desires the product. Hence capturing, analyzing and disseminating the right information is the key to the success of any operation. An efficient SCM system has the capacity to capture and disseminate the right information to the right people at the right time or in real time.

The next vital constituent is **supply** or everything that will cause a flawless or efficient supply of basic materials to the production facilities. This includes relationship with suppliers. Companies must carefully select suppliers for basic materials. When choosing a supplier, focus should be on developing velocity, quality and flexibility while at the same time reducing costs or maintaining low cost levels. In short, strategic decisions should be made to determine the core capabilities of a facility and outsourcing partnerships should grow from these decisions.

Production is the next key constituent of SCM. Production relates to making what the customer wants. Hence this key component takes decisions related to what and how many products to produce, and what, if any, parts or components should be produced at which plants or outsourced to capable suppliers. These strategic decisions regarding production must also focus on capacity, quality and volume of goods, keeping in mind that customer demand and satisfaction must be met. Operational decisions, on the other hand, focus on scheduling workloads, maintenance of equipment and meeting immediate client/market demands. Quality control and workload balancing are issues which need to be considered when making these decisions.

Distribution both into the production facility and out of the facility can contribute significantly towards enhancing the competitiveness of the manufacturer. It is a cost centre that can contribute effectively by maintaining high service levels. Reaching the customer on time without compromising on quality and other features of the product are vital. Modes of transportation to be used, frequency of distribution, etc. are some of the key decisions that require to be taken based on the field situation.

Supply stock (inventory) is another key constituent of SCM. Achieving a fine balance between overstocking and understocking is the biggest challenge of SCM. The situation becomes extremely critical as there are numerous points or echelons through which the product passes and spends some time before embarking on its next journey. And till it reaches its penultimate point, i.e. the customer, its existence is not justified. The entire investment that has gone into making the product and distributing realized only after the customer pays for the product. Therefore the faster it happens, the better it is for the company. So it is important that the product moves swiftly through the various stopovers and this is true not for one or two products, but for all the products of the company. Excess inventory is caused when these products spend more time than required at one particular point and finally a stage comes when they may remain stagnant. Hence this is one extremely critical area in SCM and finding an appropriate solution is the key to achieving flexibility and agility in the market.

SCM ACTIVITIES

SCM is the combination of art and science that goes into improving the way a company finds the raw material and components it needs to make a product or service, manufactures that product or service and delivers it to the customer.

Following are the activities involved in a supply chain:

- **Plan**—Planning or evolving a strategy for managing all the resources that go towards meeting customer demand for products or services. As a part of the planning process, one must also evolve metrics to evaluate the supply chain performance.
- **Source**—Choosing suppliers who will deliver goods and services as per specifications. This also includes developing measures to control inventory and ensuring smooth information and product flow.
- **Make**—This activity involves manufacturing and converting the raw material into the finished product. It also involves sub activities such as scheduling production-related activities.

- Deliver—This involves logistics or distribution. It consists of all the steps necessary in reaching the product to the customer.
- Return—Handling exceptions and errors wherein the customer wants to return some or all of the products. This activity is part of the service offering of the supply chain.

SUPPLY CHAIN ORGANIZATION

Having an ideal supply chain structure within the organization, especially the way the reporting structure works in the organization, can make a lot of difference to the manner in which a supply chain functions within the organization. The authors came across several hierarchical structures in different companies' studied for the purpose of this book. Given below is the most ideal and best functioning structure (see Figures 1.2).

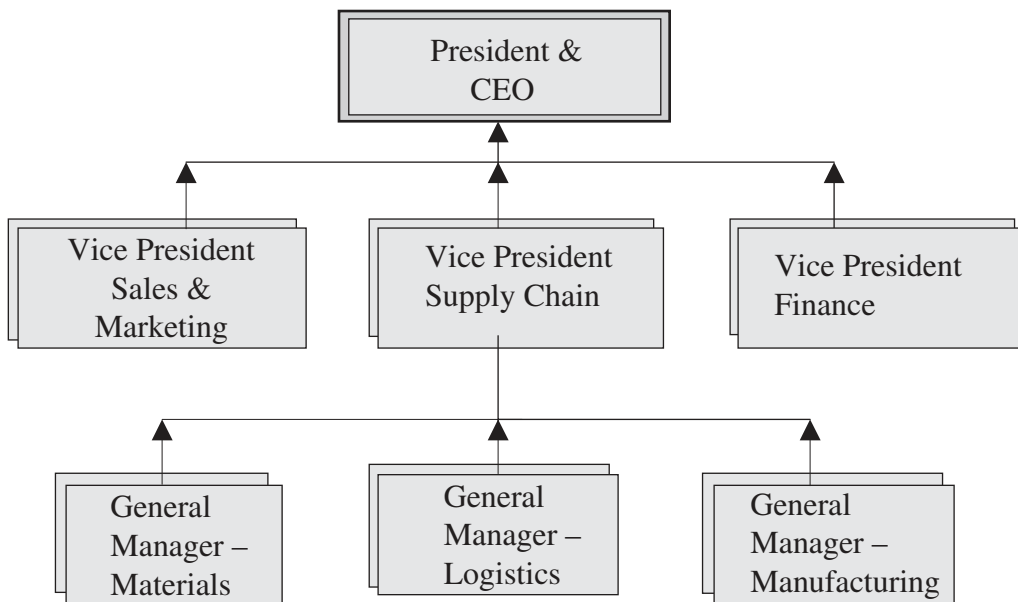


Figure 1.2 Ideal Supply Chain Organizational Hierarchy

In this structure all the functions involved in ensuring a smooth flow of material and information through the organization are handled by the same department and the same people, thus giving them a larger and broader view of not only the organization but all the business partners involved in achieving the end.

Implementing Supply Chain

“How do I go about implementing an SCM strategy? Is there a formula for implementing SCM? Is there a proven method that will not fail?” These and many such questions bother the CEOs all the time. There is of course no standard implementation policy. Supply chain is a function of how each product travels from its origin to destination and since this is completely product specific, supply chain also has to be accordingly designed and implemented. SCM requires the integration of processes composed of materials, services, information and cash within a company, as well as within the network of companies or organizations that manufacture and deliver products and services from initial sources to end users.

The challenge is for firms to internalize the approach throughout their firms and their trading partners in end-to-end total supply chains. The move is from "enterprise" to "immediate extended" to "total, end-to-end" supply-chain thinking. However, post implementation analyses of the some of successful supply chain implementation projects reveal the following four commonalities:

1. Crafting project vision
2. Managing organizational change
3. Choosing the right implementation approach
4. Managing technical challenges

CRAFTING PROJECT VISION

The most important pillars of success in a Supply Chain project is its vision. How clearly is the vision stated? How much does the vision encapsulate organizational

performance through supply chain? How would “change” be handled? How will the functions within the organizations collectively and tirelessly work towards achieving project vision without sacrificing their individual identity and individual goals? Experience has shown that in most implementation projects, more than 40 per cent of the project manager's time is spent in performing stakeholder management, especially at the executive level—ensuring that all individuals are aware of the project benefits and timeline, and managing their expectations of the project. A strong voice in support of the project that will be heard across all departments within the supply chain goes a long way in ensuring project success further down the road.

MANAGING ORGANIZATIONAL CHANGE

In order to have a system that allows information to travel effortlessly and without any loss, the organization and the various functions therein have to align themselves to form a single entity. This necessitates redesign of the business process to fully exploit the functionality of the new information system. Increased interaction between all functions within the supply chain is desired, resulting in the creation of a single supply chain entity with multiple, interdependent functions such as sales and marketing for demand planning, product pricing and promotion strategies, purchasing for vendor management and procurement planning, manufacturing for capacity planning and schedule optimization; logistics for inventory and distribution planning; and finance for financial impact analysis and profitability. A strong case for advocating this change where functions understand and appreciate the need for cooperation can definitely spell success. This area also includes the manner in which the organization has defined its relationships with entities outside the organization. The wave of change will also impact these relationships considerably—relationships with the suppliers, with the distributors, with the retailers and also with the customers. There will not be any place for antagonism and animosity. Cooperation and collaboration will decide the future course of relationships.

CHOOSING THE RIGHT IMPLEMENTATION APPROACH

Depending upon how much the organization is ready in terms of doing things differently, implementation methodology needs to be chosen. Mental and emotional tuning can set a good pace for accepting this change.

Two general implementation methodologies exist: the big bang approach, and the staged implementation approach. The big bang approach, in which the entire suite of supply chain planning tools is rolled out in one concentrated effort, is often suited to those organizations that are very capable of managing significant change. These organizations usually have some previous experience with similar projects, in which the project scope is significant, yet expected in a continuous improvement environment. This approach tends to be capital intensive and requires significant resources both internally and externally from software vendors and external project partners.

The second general approach is the staged implementation. Applicable to large-scale projects that represent significant organizational change, this approach manages the change effort over a number of project phases. Project deliverables are prioritized by required capital expenditures, available resources and return on investment, such that benefits are phased in over the life of the project. This approach is often used in situations where the proposed change is simply not manageable in one large roll-out phase, or where the capital required to implement the full solution has to be augmented by early savings from the project.

MANAGING TECHNICAL CHALLENGES

Technology solutions always bring with them significant technical challenges that must be addressed during the implementation project. Though these challenges may be unavoidable, some warning of what to expect greatly minimizes the effect that difficulties may have on successful and on-time project completion:

1. **Technology architecture:** Supply chain planning solutions run on a variety of platforms, using various system architectures. The organization must select architecture appropriate to its overall IT strategy, which also addresses specific needs of the business. While software functionality often drives system selection, technical considerations, such as system response time, may prove to be important decision factor as well.
2. **Interfacing multiple systems:** Whether integrating existing legacy or enterprise resource planning systems, or implementing supply chain planning and enterprise resource planning systems concurrently, interfacing

multiple systems is often a significant challenge. Once again, a strong communications strategy will ensure that the appropriate information is made available to project team members early enough to work around potential difficulties.

3. Data accuracy and integrity: Just because data exists in some system within the organization does not mean it is accurate. Prudent implementation teams will highlight key data requirements early, to ensure that data validation, and in some cases data cleansing, will not adversely affect the project's timeline or ultimate effectiveness.

Successfully implementing a supply chain planning technology solution is a challenge that many organizations will pursue in coming months and years. Project methodologies must be customized to meet the individual requirements proposed by unique business environments. A solid understanding of the challenges and barriers to project success will reduce the risk of projects running over budget or over time.

Although as mentioned earlier there is no “one size fits all” solution for supply chain implementation, yet paying close attention to the four key elements outlined above, will help to ensure that project difficulties are expected, understood and resolved in a quick and efficient manner.

WEB-CENTRIC SUPPLY CHAIN

The latest generation of supply chain management is web-centric. It is characterized by the marriage of the Internet and the supply chain and has resulted in the birth of electronic business (e-business) applications. These Internet-enabled, e-business applications have integrated Internet with all branches of the supply chain and emerged as the most cost effective means of supply chain operation. E-business applications (e-procurement, e-commerce and e-collaboration applications) change the supply chain from a linear, rigid chain into a dynamic chain based on an information hub called an enterprise resource planner (ERP). The ERP-controlled information hub serves as the nerve centre of the central client's operations and every other part of the supply chain is a spoke connected to the hub, as well other spoke, through the Internet.

Supply chain management shifts the focus of analysis to the big picture, or the whole supply chain, as opposed to a single warehouse, plant, or company. The supply chain, which typically spans multiple companies, has demanding needs that are becoming increasingly more complex and difficult to link together. E-business applications have evolved into the most intelligent and optimized tools which execute front-end and back-end operations in a supply chain, using the Internet. E-business applications effectively provide an information system that links multiple companies in the chain.

The centre of the e-business supply chain is an information hub (a node in a data network where multiple organizations interact in pursuit of supply chain integration), where incoming information is quickly processed and then sent out to other chain-members. The hub also has capabilities of data storage and push-pull publishing. The information hub would be a website or a server running on the Internet. The server/website would run an enterprise resource planning for supply chains. This enterprise resource planning would be a specially designed software application for supply chains that serves as the nerve centre of the organization—the repository for storing and tracking internal information about inventory levels, pricing structures and other key supply chain factors.

E-BUSINESS APPLICATIONS

E-business applications in SCM can be divided into three basic categories—e-commerce, e-procurement and e-collaboration applications, all of which support supply chain integration over the Internet. E-business applications are centred in the information hub and also run on various other parts of the supply chain.

E-COMMERCE

The many tasks of e-commerce begin when a customer places an order. However, they go beyond the initial business-to-customer (B2C) transaction to include internal processing as well as the multiple business-to-business (B2B) transactions that occur in the back-end of the supply chain. Imagine this scenario: a customer places an order, the order begins a series of transactions throughout

the chain—first the order must be quickly and accurately processed (within the information hub), next comes the interaction with the many other members of the supply chain. Next, the software must process other transactions such as tracking the status of orders and recording performance measures linked to the supply chain, such as lead time, quality and inventory turnaround. Some of the many tasks of e-commerce applications are:

1. Executing orders by customers—connects the information hub with the customers.
2. Communication between the members of the chain—connects the hub with back-end members of the chain.
3. Electronic and instantaneous order tracking.
4. Remote sensing, testing and diagnosis of problems in various parts of the chain.
5. Recording useful performance data about the supply chain.

A classic case where all of the above has been significantly achieved is Amazon.com, the most successful internet-based enterprise that sells books, medicines, toys, electronic items, etc. online to a global customer base. Not only does the site take care of personal likes and dislikes of each unique visitor to the website, but it processes and delivers the product in record time. The entire supply chain is well oiled and moves at breakneck speed.

E-PROCUREMENT

The procurement process is that process by which a manufacturer procures products from suppliers. The volume of products exchanged in the procurement process is enormous and the Internet helps to manage the complexity of this process. Many companies, such as Ariba, Free Markets, etc. offer web-based procurement tools that link manufacturers and suppliers, or buyers and sellers, into real-time product exchange communities—virtual, dynamic markets. Internet procurement solutions automate all steps of the procurement process—acquisition to order, as well as the payment transactions.

Currently, many industries, electronics, chemical, foodstuffs, etc. have electronic marketplaces available for buying and selling. For example, chemconnect.com is a global marketplace for chemical, plastic, feedstock and related products that offers information, expertise, e-commerce tools and global trading community that companies in diverse industries need to streamline transactions and reduce costs. Chemconnect has active network of trading partners—more than 9000 member companies from 150 countries (at the time of writing this book) can access reliable market information, reduce process inefficiencies, and improve profitability. Firms using such tools need an e-procurement software, linked to the marketplace. Such marketplaces allow the companies to accurately assess the market, get quotes from the best of the best vendors from different parts of the world, streamline negotiation process, provide adequate support in getting the best market price, managing and hence minimizing risks, if any, and finally automating order processing and fulfilment. The software include sophisticated data storage, marketplace management and monitoring tools—part lists, quote lists, decision-making, ordering and order change tools, for example, and logistic/payment tools that drastically cut down on time and effort spent on procurement. The popularity of such e-marketplaces and corresponding procurement tools is on the rise and according to an estimate of the research firm Gartner group by 2005, more than 500,000 companies will be participating in business-to-business e-marketplaces as buyers and/or sellers, developers and managers of B2B marketplaces.

E-COLLABORATION

Businesses thrive on effective and flawless collaboration between its employees and with its suppliers, franchisees, distributors, dealers, stakeholders and customers. E-collaboration allows companies to share information, collaborative planning and collaborative product development. Collaborative planning provides a means for implementing group decision making; decision making in a cost-effective way, because it considers every part of the chain. Enterprises across the chain can effectively exchange the necessary knowledge to make wise decisions for the whole chain.

Essentially, e-collaboration technology allows for realtime sharing of product sales forecasts, replenishments plans and as a result, it can closely match supply and demand across the whole chain. Ultimately, the collaborators can jointly reduce inventory costs and raise customer service levels.

Product life has become shorter and shorter as technology improves at increasing rates—this is called quick product rollover. E-collaboration solutions enable realtime contribution from engineers, product developers and front-end representatives to new products. Furthermore, e-collaboration software allows for quick changeover to new suppliers and manufacturers to facilitate the changes in products. E-collaboration has brought the major benefits of the Internet to engineering and product development. For instance, to invigorate strategic relationships with key customers, Sun Microsystems has deployed web-based collaborative planning tools that help it manage product life cycles, exchanging information with customers about promotions, product status, orders and shipments. Result: reduced lead times and improved inventory turns have boosted customers satisfaction and made supply chain operations more efficient.

There are many advantages of the Internet-enabled supply chain. The Internet-based supply chain is a self-fulfilling prophecy. While it revolutionizes SCM, and makes the vital tasks associated with SCM simple, the Internet is also the cause of the exponentially more complex supply chain that exists today. The global nature of Internet have provided businesses with a global market for suppliers, manufacturers, and customers and the larger the spread and reach, the more complex the nature of the business and hence SCM. However, benefits such as quick returns, speedier optimization and allround efficiency benefits which e-business applications offer are necessary and unmatched by older technology.

The next future trend in SCM, will transcend it to a completely different level—to “intelligent supply chain (SC) with intelligent information centre”. These intelligent SCs will have the capacity of doing automated translation of quantitative data into better supply chain performance. The Internet evolution has made massive quantities of useful data about the supply chain available. However, it remains a challenge to systematically analyze this data and quickly implement the resultant changes into the supply chain.

Some of the most influential business leaders have made some very bold statements about the Internet and e-commerce. For example, General Electric (GE) is a company that has launched very aggressive e-commerce initiatives. So aggressive, in fact, that Jack Welch, well-known CEO of GE, was quoted in Fortune magazine as saying “within 18 months, all of our suppliers will supply us on the Internet or they

won't do business with us." General Motors (GM) is putting more emphasis on e-commerce with the creation of e-GM, a group which will have oversight responsibilities for all of GM's Internet-based activities. Initially, the group will have a staff of 200 with the objective of making GM a major force in e-commerce. The scope of their activities will include everything from product development, supply chain management, car sales, marketing and even the on-board communication and information system in automobiles.

Even more intriguing is the rapid evolution of the digital marketplace. Recently, i2 Technologies announced TradeMatrix.com which will eventually allow buyers and sellers to transact in a single intelligent, multidimensional marketplace that connects multiple trading exchanges. This will allow buyers to consolidate orders from multiple vendors and subsequently provide for the effective integration of the final logistical activities. The key is putting intelligence into the super portal so that customers can get their information their way.

TOP SPEAK ON SCM

This is a collection of some of the statements made by the doyens of industry and academia on SCM. This gives a good insight into the minds of people who have made new rules and evolved new processes.

Our supply chain process was very well-executed, but we had an opportunity to increase our efficiency, make the process paperless and provide a single system of record that we and our suppliers could share.

— *Eric Michlowitz, Dell's Director of supply chain e-business solutions*

As always the challenge for top management is setting the right priorities, allocating appropriate resources, and of course, achieving the required results.

— *Michael Donovan, President of R. Michael Donovan & Co. leading SCM Consultant.*

In the future, firms won't necessarily compete. Instead, entire supply chains will compete against other supply chains. By developing relationships and efficient

flow patterns from suppliers through to customers, the company can both attain efficiencies and seek innovations.

— *John Chambers, CEO at Cisco, said in the early 1990s.*

It's the complete antithesis of how companies used to do business, which was have engineering and maybe marketing, sit down and figure out what products to build. They would design it, engineer it and build it and then figure out how to sell it. In the new e-commerce model it is completely the other way around. For example, Dell asks their customer what they want, within a set of boundaries of course, and then Dell figures out how to build it. So, it's a complete pull model instead of a push model.

— *Christopher S. Selland, Vice President of Customer Relationship Management and Internet Computing Strategies at the Yankee Group.*

Often, companies attempt to achieve supply chain excellence but only focus on perhaps one or two supply chain building blocks—and not on all dimensions needed for top performance. There are five key dimensions of supply chain management that are needed to achieve superior performance. These include strategy, infrastructure, process, organization and technology. Each dimension includes at least three questions that an organization should answer as it strives to achieve supply chain excellence.

— *Copacino, William C., "Copacino on Strategy: Get the complete Supply Chain picture" Logistics, November 1998, p. 45.*

Supply chain principles primarily tell us three things. One, if a company can compress its lead times and raise quality and accuracy at every stage, service will improve and cost will fall out of the business. Two, organizations should take a process view rather than a functional view of the operation. Three, working across functional boundaries to integrate business processes is the future. Change in the supply chain can be focused on improving the characteristics of supply in the context of the goals that have been set for service and/or changing the service objectives.

— *Braithwaite, Alan, and Edouard Samakh, "The Cost-to-Serve Method". The International Journal of Business Logistics, Volume 9, Number 1 1998.*

Companies must look beyond conventional methods when seeking to justify investments to improve their supply chain. Too frequently, organizations take a one-dimensional approach that centers on IT's ability to process transactions more effectively. The more compelling arguments underscore the investment's hard benefits—the impacts of an IT-enhanced supply chain on ROI, net income and cash flow.

— Krass, Louis John, “Building a Business Case for Supply Chain Technology.” *Supply Chain Management Review*, Winter 1999.

CONCLUSION

SCM is here to stay and we are at the beginning of the spectrum. We still have a long way to go and miles to conquer before the entire industry, all players and all participants become supply chain enabled and get the necessary tools to make informed decisions. Companies have a lot to gain from SCM implementation. Individual companies will definitely gain tremendously but the benefits will move beyond the four walls of the company and everybody—all involved entities will gain. This will obviously have direct repercussions on the country as this releases the locked-in working capital.

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Supply Chain Management

WHY IS SCM VITAL FOR ORGANIZATIONS?

The customer has been pronounced the ultimate king deciding the worth of any business. Manufacturing products and manufacturing them for the customer according to his wishes have, over the years, become completely different aspects. There is a series of activities that start after the customer triggers the demand. Procurement of raw materials, manufacturing the product, distributing the product and finally reaching the customer—the process is long-drawn and tedious. The need to complete these sets of activities at a pace that satisfies the customer at the same time as the bottomline, has led to the large-scale adoption of the principles and philosophies of SCM.

This chapter outlines the importance of SCM for corporates and companies and the contribution that it can make to their bottomlines.

WHAT IS A BUSINESS?

What is a business and how is a firm or an organization defined and what is its purpose? It is very vital to understand this as the basic principles of SCM are based on this theory.

“A business is an organization of people producing a product usually to sell for a profit.”

Miriam Webster’s defines business as “a usually commercial or mercantile activity engaged in as a means of livelihood.”

This definition clearly states that there must be several features for a business to exist; first of all there must be people to run the business according to its size.

Secondly, there must be a product that the business is trying to sell. The product may be one that they have come up with, e.g. a new soft drink, or it may be a service of some sort, e.g. coolcab.

Thirdly, the business is usually established to make a profit; this can only be done if there is a market, which has a demand for the business’ product.

The first and second features are naturally the reasons for the business to exist and hence what is vital is the third point, that is **market**. To understand the dynamism of the market and the various forces acting upon the firm that makes it capture or lose the market, it is important to get some theoretical insights.

THEORY OF FIRM

Ronald Coase in 1937 observed, *“Firms exist because there are costs to using the market.”*

For Demsetz (1995) a ‘firm’ is any individual, or group of individuals, that undertakes specialized production, that is, producing for others rather than for their own households. Firms exist because they are able to produce goods more efficiently than households can. **The alternative to the firm is not the market but the household.** If firms are less productive towards households, people will become self-sufficient and produce goods for their own consumption (Demsetz, 1995, 1997).

Thus, firms exist to create wealth or profits. While firms are doing this, there are two forces acting upon the firm (Figure 2.1). These forces define the firm’s behaviour and approach and come from the customer on the one side and from

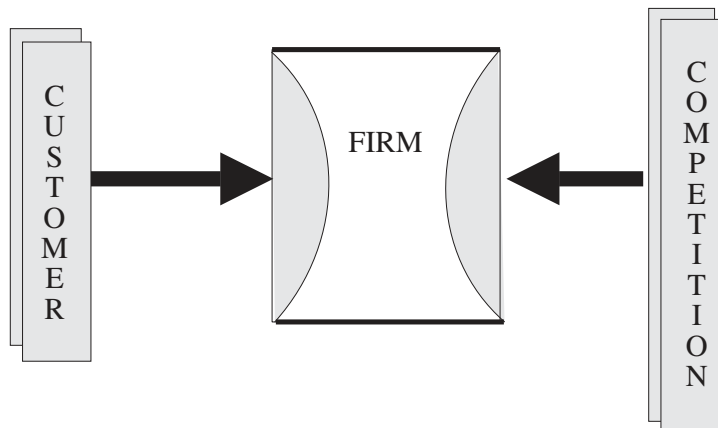


Figure 2.1 The two forces impacting the firm

competing firms on the other side. As mentioned earlier, the firms have to be productive and this productivity will make them more competitive and help them grab the end-user market. If the firm is productive, it automatically becomes competitive in the marketplace.

Firm can counter these pressures by acquiring a right approach to the five rights that are required to win the ultimate end user. That is, the customer can be won if the right product reaches him at the right place in the right quantity of the right quality and finally at the right price.

RIGHT PRODUCT

A product is right only if it appeals to the customer. That is, if the product is made as per the specifications of the customer. This is easily possible in the case of industrial products. But in the case of retail products, it is important to go to the field and study the customer's behaviour, likes and dislikes. On a day-to-day basis the retailer or the distributor acts as the best contact point. For this information to flow smoothly through the firm, the structure of the firm should not be very unwieldy and layered, or the information will either get lost or distorted.

Michael Dell's build-to-order (BTO) system wherein a computer is made based on the configuration defined by the customer does just that. The BTO model makes

the “right product”. A product is right if it is desired by the customer and meets his requirements fully.

RIGHT TIME

The customer decides the right time. It is the time when the customer wants a particular product. Time has two aspects: That the product is made on time and that it is delivered to the customer on time.

Any product can be made on time if the manufacturing is scheduled on time and for that all the raw materials, components and semi-assembled products should be available on time. Hence there should be cooperation from the manufacturing, i.e. the internal systems should be in order and in conjunction. The suppliers should also cooperate, i.e. the external systems should also be well regulated and in sync.

Going one step further, suppliers can cooperate only if their own suppliers are also delivering on time and cooperating with them. Once again, supplier's suppliers will cooperate if their own suppliers are sending them material on time. And the story continues till the first link or point of origin is in line with the rest of the process.

Once the product is made on time it needs to be delivered on time. This means that packaging, distribution and retailing needs to be done before the customer desires the product.

RIGHT QUALITY

Right quality is what that makes customers happy. The product meets their desired level of satisfaction. Quality also has two aspects: Quality at the manufacturer's end and quality at the retailer's end.

Quality at the firm's end is a function of quality of raw materials and all other products that go into manufacturing the product and the manufacturing process itself. Once again, the quality of the raw material is a function of the supplier's productivity and his distribution system and how quality sensitive it is.

Quality at the retailer's end depends upon the in-transit quality, i.e. the quality of distribution, uploading and downloading of the product. How careful an approach the retailer has towards the product is also an important factor that determines the quality till the customer comes and demands the product.

RIGHT QUANTITY

Quantity is what is demanded by the customer and as communicated by the retailer. Hence, information on the exact amount of customer's requirement is important to identify and communicate to the firm. Most of the firms whose product is a high-value item have started the BTO or ship-to-order (STO) strategy. For this it is important that the various communication channels are proper and smooth.

RIGHT PLACE

Finally, reaching the product where the customer desires it, is predominantly a function of distribution.

This means that if the firm wants to be productive, it needs cooperation and support from several entities, all of whom must work in unison to service the end user. When all of them are productive the firm can be productive. A productive firm is competitive.

This is the crux of a supply chain. It links all the entities that can help the firm become productive and therefore competitive.

Though these supply chains are as old as the firms and have existed since the firms have existed, it is only recently that firms have started looking at achieving coordination between the various entities. Though SCM has existed for a long time, it has only recently been recognized as a business concept.

FIRM AND MARKET SHARE

What makes SCM suddenly so hot? Why does 'the internal behaviour of the firm' impact the firm's external management? Why has market share become a function

of the kind of relationship the firm shares with its suppliers or distributors or transporters? Why is it necessary, to start the supply chain from the end user or ultimate consumer instead from the n th-tier supplier?

The reasons can be attributed to the **3Cs**: customer, competitor and climate, i.e. the economic climate.

The customer has become aggressive, constantly seeking and exploring options. The competitor has also become very aggressive, constantly using unique and innovative ways of winning the customer. The climate that encourages competition, creates a situation which is not too favourable to the firms trying to do business.

THE CUSTOMER

The aggressive behaviour of the customer can be expressed as:

- Price: He wants to negotiate and dictate the price.
- Product: No compromises on what he wants.
- Place: He dictates the place of delivery.
- Product changes: The aggressive customer wants variety and demands product changes very frequently.

THE COMPETITOR

The aggressive behaviour of the competitor is expressed in the following way:

- Product bundling: Competition has been bundling products with something else, be it service or some other product to lure the customer.
- Service component: Before and after sales service has become a prime motivator for the customers to take buying decisions.

THE CLIMATE

The aggressive economic climate (India) makes the following demands on the firm:

- Deregulated industries.
- Liberalized trade.
- Opening up of Indian economy to foreign investment.
- Reforms in financial sector.

Thus, all these three forces, i.e. customer by asking for more, competitor by showing a willingness to give more at any cost and economy by enabling foreign and international players to vie for the same market share makes competition severe and makes the firms find cost-effective solutions. All this makes the firms look internally to become more flexible and fast so as to reach the customer whenever he demands.

There is no way they can do all of this alone. They have to make their business partners, i.e. the suppliers, the dealers, the wholesalers, the distributors and the retailers to cooperate in winning the end user.

The companies have all realized that the game is no more restricted to one firm as against another but clearly an entire chain against the chain. This puts a lot of onus on each member to perform optimally.

As mentioned earlier, SCM as management discipline came to be recognized only recently as a tool for generating in-house profits by saving costs. Management thinking and management theories that support the development of the concept of SCM have been in existence for a long time. In other words, though economy and other conditions dictated the birth of the concept of SCM, management philosophies have been continually in the process of evolution. Before delving into details and rudimentary background of SCM, it is essential to run through the management thinking that has influenced the philosophy behind SCM.

EVOLUTION OF SCM

The first known management thinker is said to be **Henri Fayol**, a Frenchman (1841–1925) who was an engineer by profession, but took a keen interest in the way businesses were run. In 1916, he made a wonderful attempt at defining the manager's role as one that includes activities as to plan, organize, command, coordinate and control.

These theories generated new interest in the area of management thinking on what the businesses or managers were doing and what they ought to be doing.

In 1911, Fayol's contemporary, an American engineer Frederick W. Taylor, (1856–1917), propounded the theory of scientific management. This included scientific thinking, training and scientific division of work. Taylor's strongest positive legacy was the concept of breaking a complex task down into a number of small subtasks, and optimizing the performance of the subtasks.

Around the same time there was another famous German sociologist and political economist, Max Weber (1864–1920) who is known for his remarkable work in evolving the Theory of Social and Economic Organization which was published posthumously in 1924. In this book he speaks about the role of authority and leadership in management, the pursuit of profit and ultimately of modern materialism. While classifying the legitimate social authority into three types, viz. rational, traditional and charismatic, he also set a criterion for effective administration.

It was Weber who laid the base of what is today known as “outsourcing”, by saying that each ‘office’ should have a clearly defined sphere of competence. In fact, a lot of work in the area of human resource development has been inspired by Weber.

Immediately afterwards an American industrialist Alfred P. Sloan (1875–1966) developed the concept of the decentralized multidivisional organization. He also propagated the systematic system of strategic planning and managerial accountability.

W. Edwards Deming (1900–1994), an American statistician, founder of the modern quality movement, and regarded by the Japanese as the key influence in their

postwar economic miracle soon followed. The quality revolution that took manufacturing in general by storm is considered as one of the most important revolutions in the history of manufacturing.

Peter F. Drucker (born in Vienna in 1909, but for several decades the leading American management ‘guru’) introduced such innovative ideas as the rise of the knowledge worker and the transition from assembly line to flexible production and empowerment. One of the world’s most influential writers on organization and management, Drucker sees management as a “crucial component to all organizations in society...”. In recent years he has worked on the management of the nonprofit “third sector” corporation, especially in the United States.

One of the pioneers of the American auto industry, Henry Ford is credited with making a car for the middle class. Ford instituted industrial mass production, but what really mattered to him was mass consumption. He figured that if he paid his factory workers a real living wage and produced more cars in less time for less money, everyone would buy them. Ford invented the dealer–franchise system to sell and service cars. In the same way that all politics is local, he knew that business had to be local. Ford’s “road men” became a familiar part of the American landscape. By 1912 there were 7000 Ford dealers across the country.

Some of the principles he gave the world:

- Cut costs by vertical integration.
- Assembly line approach to production with the following principles:
 1. The planned, orderly and continuous progression of the commodity through the shop;
 2. The delivery of work instead of leaving it to the workman’s initiative to find it; and
 3. An analysis of operations into their constituent parts.

Ford’s use of the moving assembly line opened the door to mass production and automation. “Automation” was coined in the 1940s within the Ford Motor Company. Ford’s objective was to create an affordable automobile, and all of his

experiments with the assembly line were designed to meet this objective. While Ford's use of the assembly line was not necessarily innovative, his goal—to produce inexpensive products on a mass basis—was. Once Ford proved that the assembly line could reduce production costs, his techniques were emulated by other industries, and the US experienced an explosion in the production of inexpensive consumer products.

Tom Peters (b. 1942) (an American, former management consultant with McKinsey's, and prolific management writer, consultant and lecturer) has also contributed to management thinking on SCM.

An expert in the areas of leadership, project management, branding, professional service firms, customer experience, talent, design, education, the women's market and healthcare, he worked extensively in the areas of leadership and strategy. His work also includes 45 precepts for managers of every level that include quality to innovativeness to listening to customers and absolutely everything required to excel in running the business.

Joseph Pine (a leading American “younger generation” management advisor, author, and lecturer, now working and writing in partnership with James H. Gilmore), soon followed with the theory of Mass Customization.

Traditional mass production methods developed in the earlier part of the 20th century produced standardized goods with little or no individuality. Mass Customization went one step closer to the customer by customizing the product as per his specification. And by producing such products on a mass scale he could do justice to his bottomline as well. Customers now seek goods and services that meet their individual needs, wants and preferences.

- New production and information management approaches and a clear focus on the individual customer's requirements, can both continue to serve ever growing mass markets and at the same time provide individual, customized, products and services.
- New ways of managing, together with new information technologies within the production process, make possible the seeming paradox of providing each customer with an individually specified product (car, computer, pair of

jeans, etc.) off the same production line, giving the “tailor-made” benefits of the preindustrial craft system at the low cost of modern mass production.

TOYOTA PRODUCTION SYSTEM (TPS)

The automaker’s focus on quality and lean production has impacted manufacturing worldwide.

TPS traces its origins to 1926 when Sakichi Toyoda invented a loom that would stop automatically if any of the threads snapped. The concept of designing equipment to stop so that a defect can be fixed immediately is a crucial element of TPS.

As a total system, TPS began to take shape in the 1930s when the Toyoda family launched an automobile manufacturing firm that was headed by Sakichi’s son, Kiichiro. After travelling to the US to study Henry Ford’s mass-production system, Kiichiro Toyoda created a system to meet the needs of the smaller Japanese market. Each process produced only the number of parts needed at the next step on the production line and at the right time. This laid the foundation for “just-in-time production”, a term coined by Kiichiro Toyoda.

SUPERMARKET APPROACH

Today’s TPS is largely credited to Taiichi Ohno, a Toyota executive Vice President who travelled to the US in 1956 to visit automobile plants. Interestingly, his most important discovery during his journey was the American supermarket. Ohno was impressed with how shoppers selected what and how much they wanted. The supermarket gave Ohno the idea to set up a pull system, in which each production line became a supermarket for the succeeding line. Each line would replace only the items that the next line selected. Ohno also created the *kanban* (“sign-board” in Japanese) system for replenishment of components or subassemblies.

Kaizen Approach

“It is harder to think yourself into a new way of acting than to act yourself into a new way of thinking.”

— Masaaki Imai.

Kaizen is the Japanese word for ‘continuous improvement’. Successful lean transformations are driven by action-oriented, team-building Kaizen workshops. While improvement must be a daily process in a truly Lean enterprise, the best way to make rapid, positive changes in a company is by *experiencing kaizen*.

Kaizen (Ky’zen) is a Japanese business philosophy first made famous by **Masaaki Imai**.

Masaaki Imai defined it as “a means of continuing improvement in personal life, home life, social life and working life. At the workplace, *Kaizen* means continuing improvement involving everyone—managers and workers alike. The *Kaizen* business strategy involves everyone in an organization working together to make improvements without large capital investments.”

Following are 10 basic steps necessary to begin implementing *Kaizen*:

1. Discard conventional fixed ideas.
2. Think of how to do it, not why it cannot be done.
3. Do not make excuses. Start by questioning current practices.
4. Do not seek perfection. Do it right away, even if only for 50 per cent of the target.
5. If you make a mistake, correct it immediately.
6. Do not spend money for *Kaizen*, use your wisdom.
7. Wisdom emerges in the face of adversity.
8. To seek the root cause of all your problems, ask ‘why?’ five times.
9. Seek the wisdom of 10 people rather than the knowledge of one.
10. *Kaizen* ideas are infinite.

TOTAL QUALITY MANAGEMENT (TQM)

In 1947, W. Edwards Deming was invited to help the Japanese work on their census tracts. Deming taught about problem solving and team work, concepts that were new to statistical quality control. He was even critical of some of the statistical quality control practices of his day. He taught that use of slogans to reduce production defects is counter productive. He thought that rewarding and punishing workers based on statistical control would be blaming the victim. He thought that the focus should be on improving the process rather than blaming the workers. He was astute enough to know that if an idea is to survive it needs organizational champions. He insisted that statistical control staff move from factory floors to management positions. In essence, Dr Deming took the idea of statistical control and transformed it into a method of management. In Dr. Deming's hands, a concept that was previously only an engineering tool became an overarching management style. That first group of engineers went back and told their managers. Soon Japanese industrialists became committed to the idea of improving quality through Deming's management methods. Following his ideas, they set up organization-wide units, involved all employees in improvement, organized cross functional teams to examine a problem and solve it. Gradually, the Japanese products improved. In time, Japanese products exceeded the quality of American products. Entire industries were lost to Japan. The success of TQM in Japan and the loss of market share by the American companies awakened the American industrialists.

TQM is a structured system for satisfying internal and external customers and suppliers by integrating the business environment, continuous improvement and breakthroughs with development, improvement and maintenance cycles while changing organizational culture.

CAUSE- AND-EFFECT DIAGRAM

The cause-and-effect diagram is also called the Ishikawa diagram (after its creator, Kaoru Ishikawa of Japan), or the fishbone diagram (due to its shape). It provides a pictorial display of a list in which you identify and organize possible causes of problems, or factors needed to ensure the success of any effort.

It is an effective tool that allows people to easily see the relationship between factors to study processes, situations and planning (see Figure 2.2).

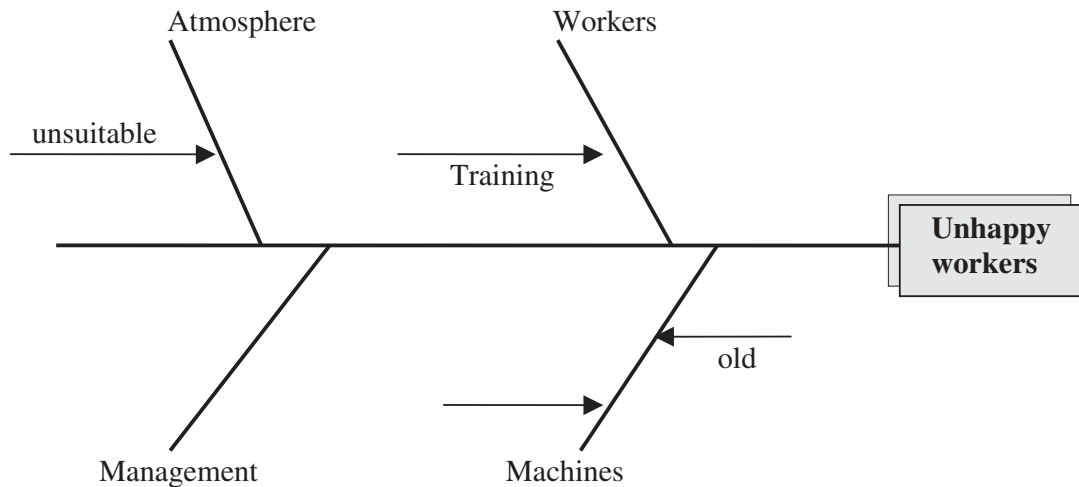


Figure 2.2 Ishikawa diagram

It was created so that all possible causes of a result could be listed in such a way as to allow a user to graphically show these possible causes. From this diagram, the user can define the most likely causes of a result.

This diagram was adopted by Dr Deming as a helpful tool in improving quality. Dr Deming taught TQM in Japan since World War II. He had also helped develop statistical tools to be used for the census and taught the military his methods of quality management. Both Ishikawa and Deming use this diagram as one of the basic tools in the quality management process.

JUST-IN-TIME (JIT) PRODUCTION

Introduction

JIT is a management philosophy that strives to eliminate sources of manufacturing waste by producing the right part in the right place at the right time. Waste results from any activity that adds cost without adding value, such as moving and storing. JIT (also known as lean production or stockless production) should improve profits and return on investment by reducing inventory levels (increasing

the inventory turnover rate), improving product quality, reducing production and delivery lead times and reducing other costs (such as those associated with machine set-up and equipment breakdown). In a JIT system, underutilized (excess) capacity is used instead of buffer inventories as a hedge against possible problems. JIT applies primarily to repetitive manufacturing processes in which the same products and components are produced over and over again. The general idea is to establish flow processes (even when the facility uses a jobbing or batch-process layout) by linking work centres so that there is an even, balanced flow of materials throughout the entire production process, similar to that found in an assembly line. To accomplish this, an attempt is made to reach the goals of driving all queues toward zero and achieving the ideal lot size of one unit.

Keys to Successful JIT Implementation

1. Stabilize and level the MPS with uniform plant loading: Create a uniform load on all work centres through constant daily production (establish freeze windows to prevent changes in the production plan for some period of time) and mixed model assembly (produce roughly the same mix of products each day, using a repeating sequence if several products are produced on the same line). Meet demand fluctuations through end-item inventory rather than through fluctuations in production level.
2. Reduce or eliminate set-up times: Aim for single digit set-up times (less than 10 min) or “one-touch” set-up—this can be done through better planning, process redesign and product redesign.
3. Reduce lot sizes (manufacturing and purchase): Reducing set-up times allows economical production of smaller lots; close cooperation with suppliers is necessary to achieve reductions in order lot sizes for purchased items, since this will require more frequent deliveries.
4. Reduce lead times (production and delivery): Production lead times can be reduced by moving work stations closer together, applying group technology and cellular manufacturing concepts, reducing queue length (reducing the number of jobs waiting to be processed at a given machine), and improving the coordination and cooperation between successive processes; delivery lead

times can be reduced through close cooperation with suppliers, possibly by inducing suppliers to locate closer to the factory.

5. Preventive maintenance: Use machine and worker idle time to maintain equipment and prevent breakdowns.
6. Flexible work force: Workers should be trained to operate several machines, to perform maintenance tasks and to perform quality inspections. In general, the attitude of respect for people leads to giving workers more responsibility for their own work.
7. Require supplier quality assurance and implement a zero defect quality programme: Errors leading to defective items must be eliminated, since there are no buffers of excess parts. Quality at the source programme must be implemented to give workers the personal responsibility for the quality of the work they do, and the authority to stop production when something goes wrong. Japanese 'Jidoka' programme provides machines and operators the ability to detect when an abnormal condition has occurred and immediately stop work. This enables operations to build in quality at each process and to separate men and machines for more efficient work. Techniques such as "JIT lights" (to indicate line slowdowns or stoppages) and "tally boards" (to record and analyze causes of production stoppages and slowdowns to facilitate correcting them later) may be used.
8. Small-lot (single-unit) conveyance: Use a control system such as a *kanban* (card) system to convey parts between work stations in small quantities (ideally, one unit at a time). In its largest sense, JIT is not the same thing as a *kanban* system, and a *kanban* system is not required to implement JIT (some companies have instituted a JIT programme along with a MRP system), although JIT is required to implement a *kanban* system and the two concepts are frequently equated with one another.

Kanban Production Control System

A *kanban* is a card that is attached to a storage and transport container. It identifies the part number and container capacity, along with other information. There

are two main types of *kanban* (some other variations are also used):

1. Production *Kanban* (P-*kanban*): Signals the need to produce more parts.
2. Conveyance *Kanban* (C-*kanban*): Signals the need to deliver more parts to the next work centre (also called a “move *kanban*” or a “withdrawal *kanban*”).

A *kanban* system is a pull system, in which the *kanban* is used to pull parts to the next production stage when they are needed; as materials requirement planning (MRP) system (or any schedule-based system) is a push system, in which a detailed production schedule for each part is used to push parts to the next production stage when scheduled. The weakness of a push system (MRP) is that customer demand must be forecast and production lead times must be estimated. Bad guesses (forecasts or estimates) result in excess inventory, and the longer the lead time, the more room for error. The weakness of a pull system (*kanban*) is that following the JIT production philosophy is essential, especially concerning the elements of short set-up times and small lot sizes.

Dual-card Kanban Rules

1. No parts made unless P-*kanban* authorizes production.
2. Exactly one P-*kanban* and one C-*kanban* for each container (the number of containers per part number is a management decision).
3. Only standard containers are used, and they are always filled with the prescribed (small) quantity.

Productivity Improvement with Kanban

1. Deliberately remove buffer inventory (and/or workers) by removing *kanban* from the system.
2. Observe and record problems (accidents, machine breakdowns, defective products or materials, production process out of control).
3. Take corrective action to eliminate the cause of the problems.

JIT II (1987, LANCE DIXON-BOSE CORPORATION)

JIT eliminates inventory and allows the buyer and supplier to work closely with each other. But JIT II goes one step further and eliminates the buyer and the salesman. The system empowers the supplier to sit inside the production facilities of the buyer and write his own purchase order. This gives complete freedom to the supplier to make key decisions about the product he supplies such as how much? When? Whether a better alternative is available, etc. He participates in all the concurrent engineering exercises related to the product, etc.

It has been said that JIT II is a technique that facilitates overall business improvement strategy. The following are some of the highlights and benefits of initiating or becoming a member of JIT II supplier programme in your organization.

- Leverage your limited resources with JIT II alliances.
- Build trust and goodwill that will enable cooperative strategic planning.
- Make an offer they cannot refuse—engage your suppliers by explaining the overwhelming immediate and ultimate benefits of JIT II.
- Maximize the benefit of your relational value (information flow) with suppliers.
- Increase efficiencies by creating a “preferred” or “certified” supplier programme.
- Improve the effectiveness of your supply chain initiatives with a JIT II approach.
- Bring your suppliers into the early design phase for improved time to market.

Hence the natural succession was SCM.

BUSINESS PROCESS RE-ENGINEERING (1993)

The word Business Process Re-engineering (BPR) was coined by Hammer and Champy and they define “re-engineering” as:

“...Re-engineering is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance such as cost, quality, services and speed.”

BPR was immediately accepted by industries the world over. This was the period wherein the market value (in current dollars) of US industrial corporations had more than doubled since 1985, while the economic value-added, the engine of value-creation, had remained not only stagnant, but negative throughout this period. There was inconsistency between reality and hope. Business executives responded to the increasing pressure for performance by embracing “re-engineering” as the cure that suddenly gave legitimacy to shocking organizations into adoption of drastic remedial measures. Though re-engineering is certainly not a breakthrough in management thinking, what has not been said before about simplifying the flow of information or streamlining organizational relationships, except that suddenly everyone was ready to listen to an old tune with a new sense of urgency. What was different in the re-engineering movement was its insistence on radical change and in advocacy of extreme measures to bring about much desired reforms. Dramatic change cannot successfully occur with a single focus, nor with a single set of skills. Organizational and human dynamics are too complex and multi-dimensional. The business of change involves an understanding of how processes, customers, employees, and information flow and interact with one another. Thus, a good BPR project will draw upon many interdependent disciplines to create a dynamic, customer-driven and process-driven organization.

BPR paved the way for implementation of several enterprise wide applications, which had the capacity to influence the entire enterprise instead of individual functions.

ROLE OF COMPUTERS AND SOFTWARE

The emergence of SCM has also been possible due to the domination of computers and software. The software industry began in the late 1950s when the use of computers for business applications expanded rapidly creating a huge demand for people with programming experience. The number of computers in use and their size and speed expanded rapidly in the 1960s escalating the demand for

software to support the numerous tasks for which computers were now being used. By the early 1960s, a customer of any of the major hardware manufacturers could expect to have access to a library of software, which was included (bundled) in the cost of the computer. This software included the computer's operating system, of course, but also utility programs (such as sort programs), compilers for languages such as COBOL and FORTRAN, and a growing library of programs written to handle specific applications. In the late 1960s, the concept of software as a product began to take hold despite the environment where customers were used to getting their software for free. The 1970s saw the contract programming industry continue to grow at a rapid pace. These companies came to be known as "professional services" firms reflecting the fact that they often provided a broad range of consulting, analysis and design services in addition to programming.

Thus began the rise of all custom-made business software that could span all the activities within the company. MRP or Materials Requirement Planning was the first to come up on the horizon, followed by MRP II and then ERP came and created a wholesome organization by synergizing the various functions.

When SCM became the business mantra, SCM-related software rose to the aid of companies implementing SCM.

Advanced planning optimizer or APO is the next in the line of software packages that has the capacity to respond to rapid and massive changes in the demand situation. More on this will be covered in the later chapters.

SCM

The concept of Supply Chain Management evolved based on several management theories as discussed above on the strong foundation laid down by high technology and the various tools that it offers. The concept however is still evolving and firming up. The current thinking revolves around value chain management.

VALUE CHAIN MANAGEMENT

Value chain is beyond supply chain and includes all that is there in supply chain and more. The principles of supply chain are supplemented by other tools that

help companies to unlock value and thereby improve competitive performance and increase profitability.

The ability to “unlock” value lies in automating the unique business processes a company employs to build a close relationship with its customers and suppliers. The value chain notion has a different focus, and a larger scope as compared to supply chain. Value chain analysis looks at every step from raw materials to the eventual end user—right down to disposing of the packaging after use. The goal is to deliver maximum value to the end user at the least possible total cost.

CONCLUSION

From quality revolution in the '70s to lean manufacturing, zero inventory and JIT in the '80s to SCM theory and philosophy in the '90s, management thinking has truly come a long way. The process is not yet over and we are definitely in the midst of a revolution that will characterize the 21st century.

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Achieving Excellence in SCM

We are what we repeatedly do. Excellence, then, is not an art, but a habit.

— Aristotle.

Competing in the marketplace is like fighting a war, with several enemies well equipped with the best weapons fighting each other to win over the customer. Customer behaviour is like a pendulum that swings from product to product without getting stationed at or being loyal to any product.

Any war needs a game plan or strategy, brave soldiers, good weapons and a dependable logistics system. Similarly, to win the market war, companies need a sound market-driven strategy (akin to a war game plan), good quality product (akin to brave soldiers) that can brave the other products, a sound and flawless supply chain management (akin to good weapons), to ensure that the right product is made at the right time and reaches at the right time, to the right place and in the right quantity.

These weapons (SCM) to be used in the market war need to be well oiled and maintained with great care to ensure that they do not fail the firm at the crucial time. And if the product and the strategy is market friendly, these are the weapons that can spell the difference between success and failure. SCM has the capability

of becoming the single most important differentiator between the winner and the loser. Hence, it becomes extremely vital for companies to concentrate on supply chain effectiveness and excellence.

In this chapter we will focus on supply chain excellence (SCE). Supply chain is a means to achieve an end, which obviously is winning in the market. SCE indicates the kind of preparedness with which the manufacturer goes to the market.

Figure 3.1 illustrates the weapons used by the manufacturer to strike the market in order to win the customer. He needs a sound strategy, the right customer desired product and SCM excellence.

SCE is one of the most vital ingredients for success in the main market. As mentioned earlier it is the answer to the question: How prepared are you to go to the main market? How prepared are you to face the stiff challenges posed by the market and how ready are you to respond to the vagaries of the market?

Having understood that, it is important to know the various dimensions or ingredients of SCE. Whether and how SCE can be achieved? What are the parameters to measure this excellence?

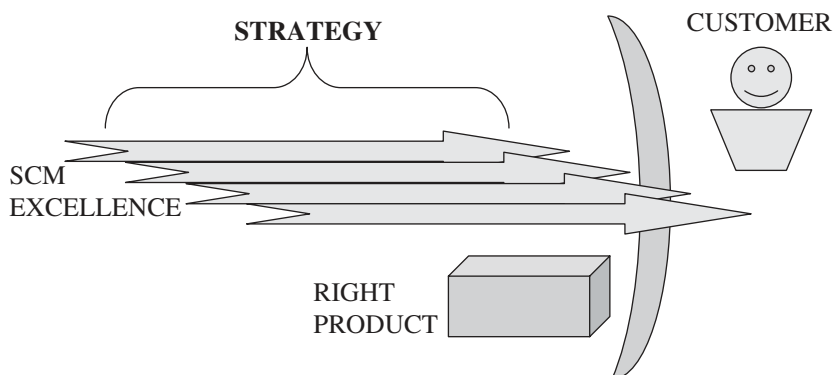


Figure 3.1 The various tools required win in the Market War

DIMENSIONS OF SCE

SCE has four dimensions:

1. Market dimension.
2. Collaborative dimension.
3. Operational dimension.
4. Strategic dimension.

Market dimension: The forces that govern the market constitute the market dimension. Market here is a general term and constitutes both the end-user market and the market from where the raw material comes. The forces that govern this market are manifold such as the political situation, legal scenario, economic priorities, cultural aspects and technological innovations and, most important of all, competition—how the competitor is playing in the market. Figure 3.2

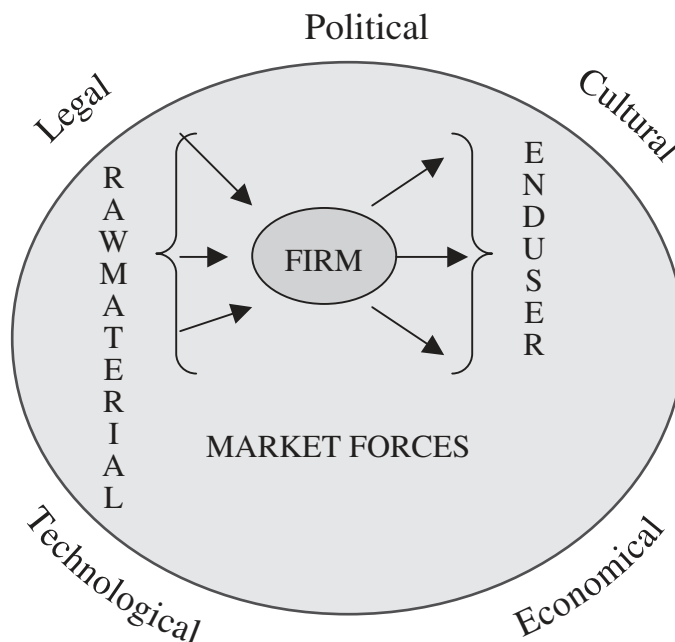


Figure 3.2 Market forces that dictate the smooth and flawless operation of SCM

details the various market forces that govern the firm. Capturing all of this information and using it to make the necessary amends within the supply chain gives it a definite edge. A good supply chain is always proactive to market forces and not reactive. A reactive supply chain cannot be fast enough to encash the opportunity.

The key to unlocking the mystery behind these market forces is simply the ability to get the right information at the right time. Also the ability to analyze the information to extract the necessary bits and pieces that impact the space in which the firm is operating is extremely important. Competition from domestic and international players, their products, promos, schemes, service levels are all vital information that anybody must possess at the right time. Right time is the amount of time the company requires to react to the competition. Hence, more agile and responsive the supply chain, the faster it will react to the market stimulus. To gain SCM excellence, firms must have proper machinery in place that captures, analyses and disseminates the appropriate information.

POLITICAL FORCES

The situation in the country, the stability, the government agenda and policies directly impact the market situation and hence the supply chain strategy. In India we have a strong history of how the changing political situation has dictated changes in market definitions. The liberalization policy of the Narasimha Rao Government at the national level in 1991 or the excise and tax policies of the state governments or more recently, the IT orientation and hence sops by some of the state governments have influenced the market and forced companies to take steps accordingly. The recently announced VAT structure by the Central Government is set to play a major role in influencing distribution-related decisions within the country.

LEGAL FORCES

How strong and robust is the legal infrastructure in the country? How much support and strength can the legal system offer to businesses? Are all the vital questions pondered upon before embarking on any business project?

CULTURAL FORCES

Culture is area specific and it is important to consider all of these factors before taking any vital decision. Management theory is full of stories about what happened when local culture was not taken into consideration. For example, Spanish is not spoken the same way in Mexico as in Spain or even Colombia. A well-known US-based retailer hired an individual specializing in Castilian Spanish to translate its English site dedicated to Latin America. The result? A picture of sneakers was labelled with the word that means ballet slippers in Latin America. Hewlett-Packard, acutely aware of this reality, offers its site in seven versions of Spanish. A website or a marketing campaign that is mostly black and white may be effective in the US, but in Asia, it is reminiscent of a funeral. In Japan, colour schemes tend to favour pastels.

TECHNOLOGICAL FORCES

A synchronized supply chain relies on strong technology support. Smooth information flow is a function of the soundness of the technology integration between the manufacturer and the supplier, distributor and other business partners.

ECONOMIC FORCES

Inflation, micro and macro economic forces, purchasing power of the consumers, employment index, disposable income, etc. are all vital factors that govern the major business decisions.

COLLABORATIVE DIMENSION

Miriam Webster's defines collaboration as a work jointly done with others or together especially in an intellectual endeavour. Collaboration or collaborative strategy for a manufacturing firm will involve a situation where both the internal organs (various functions) of the firm and the external organs such as suppliers, distributors, etc., all work in unison towards achieving the same goal. This dimension is both relationship-based and value-based. Relationship-based refers to the

type of relationship built with the external organs of the firm and how much they prioritize the firm's work. Value-based refers to the amount of value or monetary rewards desired out of this collaboration. But the onus of creating and maintaining these relationships lies with the firm, because it is the firm's product that everybody is involved in taking to the end user that ultimately fetches them rewards.

OPERATIONAL DIMENSION

This involves a smooth, error-free method that transforms the basic materials into the customer-desired product. This conversion process should be wasteproof. One of the major problems faced by manufacturers the world over is fighting waste. Toyota Production System defines seven different types of wastes: overproduction, waiting, transport, inappropriate processing, unnecessary inventory, unnecessary motion, and defects. Overproduction is regarded as the most serious waste as it discourages a smooth flow of goods or services and is likely to inhibit quality and productivity. It also tends to lead to excessive lead and storage times.

STRATEGIC DIMENSION

It is the plan of action which drives the whole SCM process. Strategy should be customercentric. It should be sewed around the customer's requirements. Supply chain strategy should provide the capability to build competitive advantage, especially since ill-designed and ill-conceptualized supply chains can lead to systemic costs.

Once the supply chain has incorporated all the above dimensions, it can be said to be advancing on the path to excellence. It is important to identify a unique supply chain for each product to achieve SCE. For each product, three types of supply chains can be identified.

TYPES OF SUPPLY CHAINS

SCE can be achieved when the three different types of supply chains can align with each other and all the three of them work towards their desired goals. It is widely

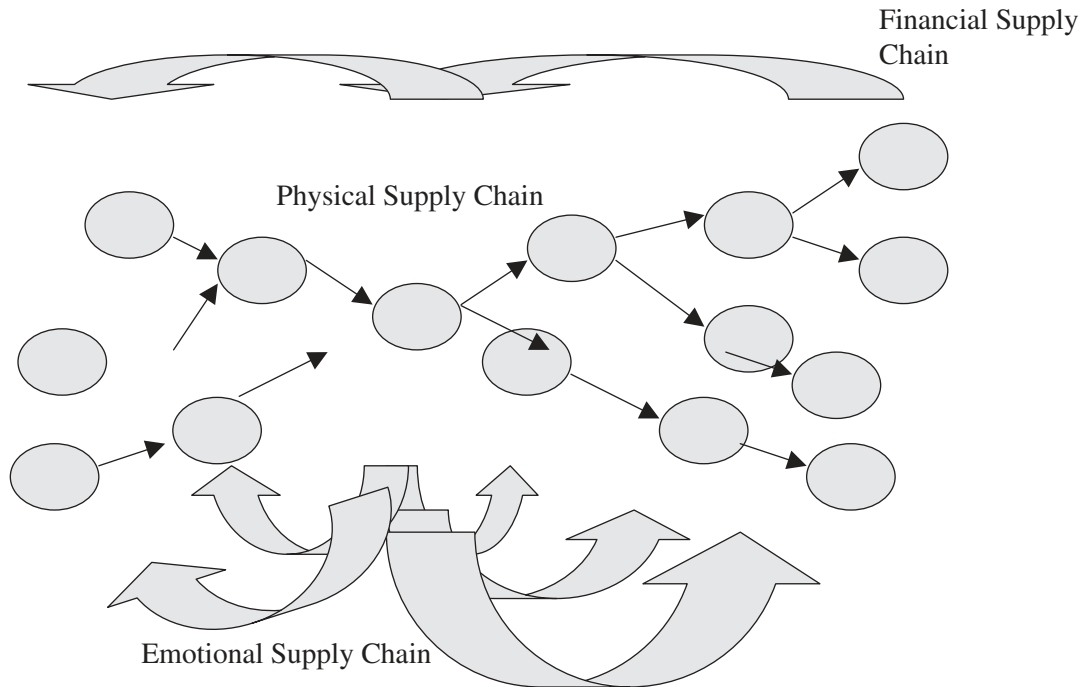


Figure 3.3 Types of Supply Chains

understood that an ideal supply chain carries material, information and cash with it. But it is much easier and more appropriate to think of three different supply chains for each product as illustrated in Figure 3.3.

EMOTIONAL SUPPLY CHAIN

This involves a mental compatibility and emotional preparation to collaborate with all the partners. It includes an ability to change, cooperate and participate in joint efforts to woo the end user. This includes building relationships, maintaining them and creating value from these relationships. This is the first step in any SCM effort. Identify your partners, establish relationships with these partners and then get down to business.

PHYSICAL SUPPLY CHAIN

The actual distribution of goods and information takes place through these echelons created by the emotional supply chain. The physical supply chain takes care of the actual transfer of goods from one place to another. The tighter the bonding, the better the understanding between the various partners and smoother the flow of goods.

FINANCIAL SUPPLY CHAIN

This explains or tracks the flow of money between the various partners of the supply chain. This is the penultimate step or process in any supply chain and signifies the end of the transaction. Once the emotional and physical issues have been sorted out, the financial supply chain takes care of faster settlement of bills and faster completion of transactions.

It is important to identify all these types of supply chains for each product. This is required as the needs and requirements for each of the types of supply chains are different. For example, the basic ingredient for establishing an emotional supply chain is relationships. And relationships can be established out of a definite conviction that they are long term, mutually beneficial and financially rewarding.

CHECKLIST FOR EXCELLENCE

Concerted effort and focus can help in achieving SCE. But more important is continuing to function and perform in the manner that pleases the customer and hence the bottomline. So how does one go about implementing SCE?

The following is a broad checklist that can be used to implement SCM to provide excellence in performance of the company.

1. Achieving Internal Excellence

Any company that cannot achieve internal excellence can never hope to compete in the external market. Internal excellence can be achieved by breaking the internal

walls that exist in the company. A cross-functional team that is knowledgeable about and is capable of taking decisions regarding all aspects of a supply chain should be formed. This team should not only be responsible for implementation of all aspects of SCM but should also take charge of the operational requirements.

2. Ensuring Visibility and Openness

Supply chain spans all the organizations that contribute to making a customer-desired product. Therefore, it is very important that all of these organizations participating in the supply chain have proper information sharing protocols between them. It should be understood that information that is being shared will be used to achieve excellence in the supply chain. But before embarking on the process of information sharing, it is essential to identify the exact nature of relationship to be shared, the kind of information that will support this relationship. What should be the frequency of this information sharing? Unless the systems that will bring in visibility are ready, it will be difficult to tread the path of SCE.

3. Ensuring Partnerships and Collaboration

Collaboration means working together to achieve the same goal. And here the goal is winning the end user. Collaboration is a function of how tuned all the business partners are to participate in the supply chain, how much information is available about the criticality of their role in the supply chain, what technological infrastructure is available to support this role. “Walk with your supplier and let your supplier walk with you” should be the ultimate motto.

4. Ensuring Amalgamation

This is one step further to the concept of collaboration. Supply chain amalgamation means showing one single face to the customer. Blending or synthesizing so much that it immediately instils confidence in the customer. Collaborating not only to produce the product but understanding what the customer wants and designing the product accordingly. Collaborate in meeting the customer deadlines and in general, servicing the customer to the best of the combined abilities of all organizations concerned.

5. Momentum and Ascent

This stage signifies that the ground is set to take off. In this stage it is important to ensure that the movement of material, information and money is fast and smooth. This stage should make the company concentrate on TAT, i.e. turn around time. The faster the movement through the supply chain, the better the bottomline gets as it reflects faster conversion of material into money.

To sum up, supply chain excellence is consistently doing the right things well. It requires new solutions that focus on key business issues, continuously measure performance and drive the organization towards continuous improvement. Most importantly, it is essential to recognize that operational excellence is a journey and not a destination. As the situations, problems and issues change, so will the definition of supply chain excellence.

“There are various degrees of excellence. The danger does not lie in failing to reach absolute perfection. It lies in giving up the chase.”

— *Anonymous.*

CASE STUDY

Mahindra and Mahindra *(FES Division)*

M&M

Mahindra & Mahindra or M&M as it is more fondly called is one of the largest private sector companies in India employing around 12,000 people.¹ Its two main divisions are: automotive sector (AS) and farm equipment division (FES).

CASE STUDY

This case study covers the story of FES division and how it achieved excellence in SCM and thereby reduced costs and waste and improved productivity.

FES DIVISION

FES Division is the manufacturing hub for a wide range of tractors and other agricultural implements targeted at farmers in India and abroad. With plants at Mumbai and Nagpur in Maharashtra, the farm equipment division reached peak sales of over 80,000 tractors annually in recent years, making it the third largest tractor manufacturer in the world. The division has been the market leader for 16 consecutive years in the highly competitive Indian tractor market. Products from

¹ Until going to press.

its stable have earned the goodwill and trust of more than 600,000 Indian farmers, and the Mahindra tractor has come to be recognized as a powerful symbol of productivity and performance.

In addition to dominating the domestic market, M&M's farm equipment wing has also found significant success internationally, with exports to the United States, South Africa, Sri Lanka, Bangladesh, Nepal, Zimbabwe and very shortly it will be entering the European market.

GROWING COMPETITION

FES Division faced an uphill task on account of increased competition from domestic and global players in a shrinking market. Shrinking market because the total sales of all tractor manufacturers put together which was around 2.60 lakh in FY01 have declined to 160 thousand estimated this year (2003). Several reasons can be attributed to this declining and shrinking market, viz. drop in buying power of the farmers, unremunerative prices of produce due to excess production in some varieties and recession in demand in many areas, no income due to drought. And to top it all, the major global players decided to enter the market. Competitors such as John Deere, Ford New Holland who were already established global players decided to venture into India. India is predominantly an agricultural economy, which is an attractive proposition for all the global players. In order to take on these new players the company had to spend on promotions and new product development. While excess costs were incurred on this, there were very few possibilities of increasing price to recover these additional costs due to burgeoning competition. This clearly put the onus of improving profitability on the internal functions and the manner in which the external functions were handled. Cost cutting was the primary agenda as it could immediately contribute to profitability.

Further, due to increased competition, the customer had a large range of products to choose from. As a result, product life cycles shortened and demand uncertainty increased, which increased inventories. The need was felt to improve the response to market demand changes while minimizing inventories.

When the Indian market opened up in the mid-1990s, global players entered the Indian market. To win against them, "we needed to build up our skills and

benchmark our processes against these global leaders, becoming better than them at managing the business. That way we would not only compete with them effectively in the domestic market, but could also challenge them for market share globally,” says Satish Moorjani, who has spearheaded the SCM implementation in the FES division.

With this background and thoughts, FES Division of M&M decided to implement SCM to withstand the onslaught of competitors in the year 2000.

ISSUES ADDRESSED

The first area that was addressed was making changes in the configuration of business processes across the supply chain from dealers to company to suppliers. This also required organizational alignment, that is, the way the organization is structured, the hierarchy, the points through which the information flows and most importantly the manner in which the responsibility is handled within the company etc. The next important area was to sensitize the thinking process or mindset of key employees within the company. It was important to inculcate a broader outlook in them. This was done with a twin purpose: One to smoothen the information flow and two, to make each and everybody within the organization look and hence focus in one single direction: customer.

FIRST STEPS

The first step was to create a separate division that could oversee the operations and implement the various philosophies. Supply chain planning and control division (SCPC) was carved out by including the vital demand planning, production planning, raw material planning and logistics of incoming raw materials and outgoing tractors dispatch. “SCPC had the one point responsibility/accountability for tractor availability,” says Moorjani. This clearly was a signal from the management to the company that SCM was to be treated seriously and it was here to stay, feels Moorjani.

SCPC had one more agenda: to implement changes in the business processes of the company to enable demand pull-based manufacturing and supply to minimize

inventories across the supply chain, as well as smoothen and improve the information availability and transparency in the system.

Therefore SCPC had the following twin objectives:

Supply Chain Objectives	Planning & Control Objectives
Reduce inventories across the supply chain by changing/aligning the company's business processes for IT-enabled Supply Chain Management	Ensure availability of tractors as per sales requirement—right model, right place, right time at least cost, by planning procurement and production across all plants as per demand.

ADVANCED PLANNING OPTIMIZER (APO)

The company had assembly/manufacturing operations at multiple locations. Hence it was important to have a system that was possible to link all the operations of the company, which could then serve as the basis for taking several vital decisions that were company specific, and not location or region specific. That is, it was important to get consolidated information on the entire business, which could then be used to create a cost-optimization strategy that would also provide operational efficiency and allow the company to respond quickly to customer needs. These vital decisions could be production-related decisions such as which plant should produce what? Distribution or dispatch-related decisions such as which plant should cater to which location? Or time-related decisions such as when, which plant should get into action.

OBJECTIVES AND TARGET SETTING

FES Division set out certain objectives for itself before venturing out. The most important objective was of course to make tractors available to the customer as and when he wanted it without having to maintain an inventory.

ORGANIZATIONAL ALIGNMENT

Organizational alignment was accomplished by breaking the ugly walls between the various departments, and between the company and its suppliers and dealers,

stock yards and suppliers. Further, it was absolutely necessary to change the orientation from “My Department” to “Our Customer”. This change of outlook could actually take care of half of the problems. Several initiatives were taken for this such as creating a general awareness about SCM by conducting training programmes. These training programme had the task of not only educating people about SCM and its importance but more importantly exciting them to participate.

Getting everybody to participate from the heart and involvement of a large cross section of the employees was necessary for successful implementation. This was achieved by involving representatives of all affected/concerned departments in implementing the changes in their respective departments.

Employees who had been used to working for their individual department goals were now expected to work for “customer-oriented goals”. It definitely meant some bits of compromises and adjustments for the failures of others so that the company as a whole did not fail to satisfy its customer needs. This now meant that everybody had a single goal—The Customer. Individual goals were not important. “There are no heroes in a losing team,” opines Moorjani. Changing behaviour patterns is a gradual process. There is bound to be friction and disputes between departments. Therefore, an integrated logistics council (IL Council) was formed comprising the heads of departments, which met once a month to sort out such issues amicably by wearing the company hat.

To increase cross-functional interaction, a system of collaborative planning meetings was started.

Further, to change orientation from self to customer, it was necessary to redefine the “measures of performance” (mop) as well as the “performance measurement systems” (pms). For example, earlier, the engine and transmission departments were measured for what they could produce against their individual plans whereas now they were evaluated based on whether they were able to meet the changing requirement of their customer, the tractor assembly department, which was also evaluated based on how well he met the changing customer requirement.

CHANGES IN BUSINESS PROCESSES

The traditional method was to plan and supply as per forecast. But in a dynamic market, this strategy could lead to a lot of problems in terms of lost sales, excess

inventory, waste etc. Hence, a business process change was required and the new mantra that the FES division adopted was: “PLAN AS PER FORECAST BUT Supply as per Demand Pull”.

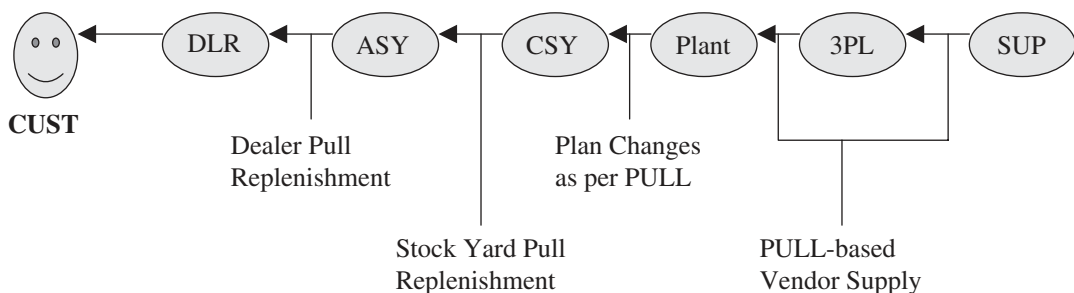
MANUFACTURING

Demand pull-based manufacturing and supply starts with the customer and hence this type of supply chain is customer facing and not internal facing.

As mentioned earlier, this supply chain is customer focused and when you focus on the customer, you automatically start focusing on your abilities and capacity to service the customer.

The supply chain at FES Division works in the following manner (see Figure 3.4):

1. Customer goes to the nearest tractor dealer to buy the tractor.
2. The tractor dealer delivers the tractor to the customer.
3. He in turn pulls the tractor from the Area Stock Yard.
4. Who then relays the message to the Central Stock Yard (CSY).



DLR: Dealer; ASY: Area Stock Yard; CSY: Central Stock Yard; 3PL: Third Party Provider;
SUP: Basic Material Supplier; CUST: Customer.

Figure 3.4 Demand based Manufacturing & Supply at FES Div M&M

5. CSY then puts the onus on the plant to deliver the tractor.
6. When tractors are assembled, components are manufactured as per requirement and raw material is pulled as per consumption.
7. Raw material stock is replenished as per norms by 3PL (Third Party Logistics Provider) who has the responsibility of collection from vendors as per demand and deliver to the plant on a daily basis.

INFORMATION FLOW IN SUPPLY CHAIN

Accurate information flow is the basic ingredient for successful implementation of smooth and responsive SCM. Internally, M&M was already using SAP R/3 and hence when the time came to spread its wings and include its suppliers and dealers and other participants of the supply chain process, mySAP was naturally chosen. The company was very clear about implementing an IT-based supply chain that uses IT and Web effectively and productively.

On the front end, private dealer-specific websites were created to act as an integration point with the 400-odd dealers. The information flow was designed such that these dealers would post the sales information got on a day-to-day basis on their websites which would then get relayed to M&M headquarters (HQ) and the nearest branch office. The branch would then replenish the dealer stock norm from their inventory and transmit the sale transaction information to M&M HQ through SAP connectivity between the HQ and all area offices. The two production facilities (at Mumbai & Nagpur) has CSY. The mySAP module would suggest the ways and means on replenishing the ASY and hence the branch offices. That is, which CSY should send the tractor to which ASY and what model, when, etc. In short, mySAP, based on the sales information, would prepare a dispatch schedule from CSY to ASY. It would also generate a pull list of the raw material required on a daily basis to replenish the raw material stock. The raw material would be supplied by 3PL companies on a daily basis as required and they would in turn pick up the same from the vendors in milk runs. For ensuring that vendors are ready with the required materials, considering their respective lead times, there would be a system of sharing with the vendors an 8-week rolling forecast of their respective materials required. For generating this forecast, M&M Area Offices

would update the demand plan on a weekly basis. mySAP SCM takes into account regional demand variation and using an APO generates a day-wise production plan for all its plants (the two main plants and eight other assembly/skid plants) for ensuring timely demand fulfilment. It also subsequently synchronizes the procurement schedules to dovetail with the production plan. The vendorwise schedules generated by MRP are directly posted on the vendor websites without any manual intervention. The week-wise schedules are therefore instantly available to its 600-odd active suppliers who now have a private website which is their window to peep into M&M operations and to know what is in store for them in the coming days. Needless to say, this information is used by vendors to get the general picture and how they need to ready themselves but they are not supposed to supply on the basis of that. All the supply from the vendors is pulled, based on the trigger caused by the actual sale at the dealer level and subsequently, the actual consumption at the plant end. A daily tractor assembly plan is made to guide the plant operations. Thus, there are clearly two strategies followed by the company for manufacturing of tractors and one regarding procurement of materials.

INVENTORY REDUCTION

This automatically brought a substantial reduction in inventory of finished goods that used to be maintained with both the dealer and the company. The dealer stock used to be in the range of 12,000 units and around 7000 tractors were kept at the company. Post-implementation of SCM business processes this stock tumbled to 6000* at the dealer level and 3500 at the company level. This 30 per cent decrease in inventory was just the beginning as the full steam implementation was

“Assemble Tractors based on TRACTOR Stock Consumption Replenishment”

“Manufacture components/aggregates based on Consumption

*PROCURE FROM VENDORS MATERIAL BASED ON ACTUAL
CONSUMPTION*

yet to happen. But soon it would have been easily possible to take this stock further down to 4000 units and 2000 units, respectively. And most importantly, not at the cost of customer response times. In fact, if at all, this has helped us become more agile and responsive feels Moorjani.

***Figures are in numbers of tractors.**

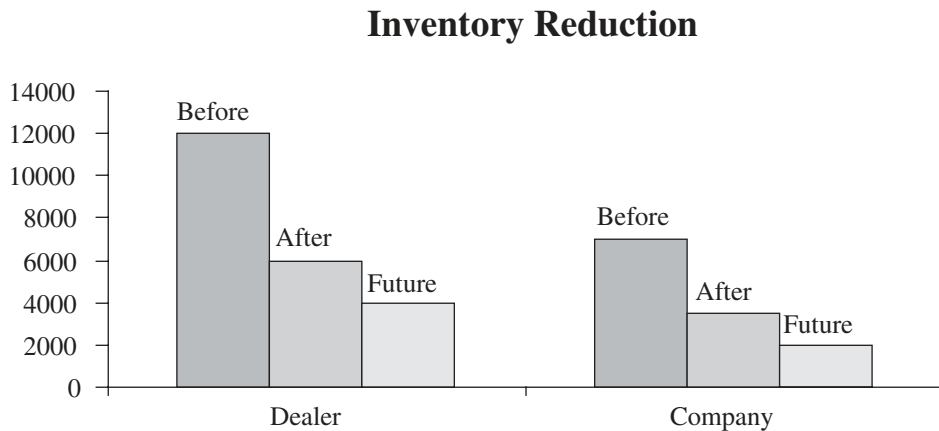


Figure 3.5 Inventory figures for tractors pre and post SCM implementation

INVENTORY MANAGEMENT

Inventory management and control is one of the major battle zones in SCM. The best way to fight this menace is to identify the reasons for its occurrence. That is first it is important to understand why there should be an inventory? What inefficiencies have caused pile ups? etc. M&M FES division identified the following reasons that have caused inventory:

1. Information mismanagement
2. Lack of supplier coordination
3. Warehouse mismanagement
4. High transit time

5. Large lot sizes
6. Indefinite and excessive supplies
7. Multiple material handling
8. Material rejection at plant
9. Sales forecast errors
10. Long planning cycle times
11. Lack of synchronization between production of assemblies and sub-assemblies
12. Lack of production flexibility in changing product mixes

The next step was to treat each cause. M&M handled the first two issues and problems that cause inventory, i.e. information management and supplier coordination by implementing the pull replenishment process. The next cause, i.e. for warehouse management, the warehouse management module of SAP was implemented in M&M; whereas, in the 3PL warehouse the 3PL uses his own warehouse management software. Issues such as high transit time, large lot sizes, indefinite and excessive supplies and multiple material handling were managed by implementing 3PL system. In order to tackle the problems arising out of material rejection at the plant, M&M proposes to extend the 3PL's role to even preinspection and acceptance at vendor's end. Sales forecast will improve with full implementation of pull process between dealers and area office with the implementation of APO's demand planning module. The last three causes, viz. long planning cycles, lack of synchronization between production of assemblies and subassemblies and finally the lack of production flexibility in changing product mixes have been addressed by the implementation of APO.

SUPPLIER RELATIONSHIP

Supplier support and cooperation is most vital in attempting to implement an SCM solution.

We have set up a team in our sourcing department for “vendor rationalization” with specific targets. “Our company supports vendors continuously in improving their manufacturing processes and even production costs,” says Moorjani.

LOGISTICS SUPPORT: (3PL)

Presently buyers are giving their daily requirements of respective items to 3PL over the Internet. In due course the daily pull list will be generated by APO. The 3PL handles all types of materials used for manufacturing—steel forgings, castings, parts, components, etc., based on daily supplies made by 3PL to the plants and the stock available. Everyday the 3PL generates a daily pull list—of vendor-wise requirement of materials to replenish the agreed stock norm level.

The following 3PL implementation process is followed at FES, M&M:

1. Decide clusters considering supplier locations and tonnage.
2. Freeze the ‘operating process’ for each cluster.
3. LSP identification and rate negotiations.
4. LSP infrastructure and training for adhering to the operating process.
5. Buy-in of suppliers that value-add offsets additional costs.
6. Supplier education and training for following the process.
7. Cross-functional support within the organization to implement.
8. Decide the key performance indicators (KPIs) and their measurement process.
9. Monitor the performance and take corrective actions to improve.

Following are some of the challenges faced by M&M while implementing 3PL system:

1. Buy-in of suppliers.

2. Ensuring supplier discipline in adhering to the process.
3. Reaping 3PL benefits without increasing costs.
4. PMS alignment for cross-functional support within organization.
5. Redefining the lot sizes and deciding warehouse stock norms.
6. Empowering 3PL for enforcing supplier discipline.
7. Enforcing discipline within organization to adhere to the process.

Lessons Learnt

1. SCM implementation poses a major challenge in change management, from the top, downwards. Take for example the change from 'Push' sales to 'Demand Pull' based sales. There is a tendency in most companies to push sales to dealers to inflate the topline. This is done to make the immediate quarter's bottomline look better. It's a known fact that by adopting this shortsighted strategy the gain is artificial but the loss is real. Unwanted stocks pushed to dealers block funds, age the stock, which deteriorates the product quality and may lead to lost customers. But, it still takes a lot of courage and effort to change from a 'Push' to a 'Pull' strategy, to let go a virtual gain in the short term for a 'real' gain in the long term. The topmost executive of the company has to drive such changes. Therefore, top management involvement and support is paramount for successful implementation.
2. SCM implementation can only be successful if there is motivation and alignment of various departments to work for satisfying the company's customer (internal or external) needs rather than those of their individual departments. For achieving this, it is important to create awareness for the need to change and drive home the realization that the company's survival may be at stake if there is no change. Also the MOPs and system of performance measurement of individuals/departments have to be realigned to encourage and reward customer orientation.

3. Most importantly, the top management should consider it worthwhile to invest their energy into driving the implementation, which is so essential. For this, it is necessary to first do a study to estimate the potential of cost saving and value addition for the future of the organization.

(With inputs from Mr Satish Moorjani, site visits, interviews and research.)

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Innovative Supply Chain Management

Like Columbus, embrace risks of setting off in new directions.

— *Anonymous.*

Innovation is doing something new, something different. Innovation is passion, an obsession to do something different or same thing differently. Innovation has four basic ingredients, viz. creating, exploring, playing and desiring and are imbedded in having passion for what you do. It is the desire to make a difference. If you are passionate about what you do, you will overcome hurdles and challenges that otherwise would have caused you to stop. Passion drives a good team and shapes the ground for innovation. Extending this to business means new design, new product, new ways of providing service, new technology, etc.

Innovation often requires a shift in mindset, 'out-of-the box' thinking. Innovation can, therefore, also be seen as the ability to run on many tracks at the same time and change between tracks. It is asking "Is there a new way for me to live my life?", "Can I bring in new dimensions?" and "Do I dare?". Some people like to say that innovation is our ability and willingness to forget what we have learnt. It is to forget our habits and encounter new territory.

The human mind treats a new idea the way the body treats a strange protein: it rejects it. Hence it is up to the organizations to encourage and provide a fertile

ground for innovation. In these competitive times it has become mandatory for organizations to breed innovation. Recently Accenture, the leading management consultancy firm conducted a survey of chief executive manager readers, and found that two third of the CEOs surveyed recognized innovation as one of the five most important factors required to succeed and sustain competitive advantage.

Companies the world over are on a major cost cutting spree and are generally trying to contract. But often, arguments and discussions focus on what is the best corporate strategy for these times? Contraction? Or exploration? Nature offers some models for survival under stress. For instance, if a human being is plunged into icy water, the digestive system immediately shuts down, the heartbeat slows, and oxygen consumption is minimized. The organism tries to preserve its core functions and eliminate nonessential ones until its next breath can be taken. That's a pretty good description of how many companies are reacting to the stresses of the current economy: contracting resources to those essential for existing core strategies and operations.

Innovation can be one way of coming out of these depressing times. Doing the same things differently, that result in cost cutting, lead time reduction, productivity improvement, quality enhancement, etc. should be encouraged.

A different reaction to change can be observed in the complex adaptive systems that species have evolved to survive in fluctuating environments. In an ant colony, for example, while some ants ferry the spoils from previously located food sources, a significant portion of the colony always spends its time looking for the next find. In business terms, while the exploiters generate sustaining revenue, the explorers invest for the future. When the colony finds itself under stress from a change in habitat or competition from a new colony, it does not contract its operations, but actually moves more resources from exploitation to exploration. More ants, not fewer, go off on search missions, and those taking care of the colony's short-term needs have to make do with fewer resources. This helps ensure that the colony as a whole will increase its chances of survival by seeking out a more hospitable niche.

So which strategy makes more sense for a company? It depends. If the company's industry structure and technology are stable and the primary cause of stress is change in cyclical demand, then "holding one's breath" is probably the preferred survival strategy. If, however, the stress is a result of changes in markets, technologies,

products, consumer expectations, alliances or labour patterns, then survival depends on shifting more resources to exploration of new markets, technologies and business models. To quote management guru C.K. Prahalad: “No one is resource poor. We are all imagination-poor. We have no courage to dream.” And Peter F. Drucker resonates: “If we achieve profit at the cost of downgrading or not innovating, they aren’t profit. We’re destroying capital. On the other hand, if we continue to improve productivity of all key resources and our innovative standing, we are going to be profitable. Not today but tomorrow. In looking at knowledge applied to human work as the source of wealth, we also see the function of the economic organization.”

The Accenture survey found some surprising results. Most companies are able to commercialize less than one in five promising ideas, and only one in eight executives felt strongly that their companies excelled at implementing innovative ideas. What is more, even the most innovative companies commercialize less than 60 per cent of their most promising ideas. The survey showed that people saw fewer barriers to idea generation than idea implementation. The underlying cause of this discrepancy is an imbalance in the innovation process: most innovation processes focus overwhelmingly on idea generation and not execution to value.

INNOVATION POSSIBILITIES IN SCM

SCM as we have seen in the past chapters, consists of flow of materials, information and money through the various echelons or “supply partners” where value gets added at each stage until it finally reaches the destination, i.e. the end user. Possibilities of improving productivity through innovation are aplenty. At every stage processes and operations should be examined with respect to whether they can be done differently and if attempted differently, how much or what kind of value gets generated, what is the improvement in productivity and most importantly what is the cost saving potential?

SCM has seen its own share of innovations over the past few years. Starting with strategic sourcing cost reduction programmes in the ’80s, the field has seen steady flow of innovations. Over the past two decades, we have seen innovations such as supplier relationships and collaborations, supplier alliances, value engineering and value analyses, JIT and JIT II, logistics outsourcing, globalization of supply bases

and the latest innovation being usage of Internet to electronically enable the supply chain and reaping the benefits arising thereof. Walmart, 3M, John Deere, Dell, Cisco, Fedex, etc. have been some of the leaders in implementing innovations in SCM and they have seen dramatic results which have catapulted them to the *numero uno* position. Companies with successful strategic sourcing programmes have reduced the cost of purchased material and services by 15–25 per cent on average—resulting in overall profitability increases of 50–75 per cent in some industries. Volkswagen has credited their ability to become the market leader in China to their success in rapidly established global supply base. Dell's BTO model as we know has altered the way businesses have been done and customers satisfied. In the process, Dell managed to reduce its inventory from 15 days in 1996 to four days in 2001.

Then there have been companies which have encouraged and implemented innovative strategies to move out of depression and for a turnaround. Post 9/11, Delta Airlines was in trouble. But having recovered, it credits its strategic sourcing policies for the turnaround. Several other examples can be cited where supply chain innovation has added significant value to the companies.

Supply chain offers vast scope for innovation. Following are some of the areas that can offer fertile ground for encouraging opportunities in innovation.

SUPPLIER SIDE INNOVATION

Companies the world over have taken major strides in improving relationships with their suppliers and creating a mutually beneficial chain. Great relationships with the supplier automatically lead to joint programmes, joint designs, joint thinking and most importantly joint innovations. One of the primary innovations to achieve cost effectiveness is the development and use of strategic sourcing. This practice changes transitions supplier relationships from strict contractual compliance to partnering agreements with shared liabilities. This allows the buyers to move from purchase order placement with little or no time for follow-up, to managing supplier relationships and monitoring market conditions. The implementation of these initiatives has resulted in a reorganization of the material acquisition function from prescriptive, transaction-based buying to commodity/services-based buying teams or "Centres of Excellence."

HOW CHRYSLER DID IT

Chrysler has been at the forefront of encouraging and implementing innovation. Be it its approach to suppliers or the way they have shaped their relationships with the suppliers or taking the lead in implementing Covisint—the largest automobile industry exchange, Chrysler has always been an “innovating” company.

Steve Walukas, Vice President of supplier quality for Chrysler Group, credits its suppliers for playing an instrumental role in the company’s recent strides in improving vehicle quality and reducing warranty-related costs. The company’s overall quality levels posted a 10 per cent gain in the most recent J.D. Power and Associates Initial Quality Survey, while warranty costs have dropped 20 per cent in the latest model year and have been cut by half since 1996.

Chrysler Group had re-tooled its approach to supplier quality over the last 18 months, stressing a return to the fundamentals and the use of better communication tools between the company and its supply base. Chrysler Group’s supply base consists of 850 top (or Tier One) suppliers delivering 50,000 different parts from 1900 separate manufacturing locations. “It’s all a part of our move towards a more disciplined and performance-oriented approach to supplier relationships,” said Walukas.

“Specifically, it’s Chrysler Group’s goal to work with an ‘All-Star’ team of suppliers for each and every product programme—those suppliers that deliver high quality, competitive costs and technical innovations to our products”. A critical element in further enhancing productive relationships between Chrysler Group and its supply base is “a culture of proactive and two-way communication.” Today, “accountability and responsibility are now being re-defined through open dialogue and the elimination of barriers that led to finger-pointing in the past.”

“Because of the rapid development of e-tools, we now have the shared, real-time data that’s needed to drive a more disciplined, yet collaborative approach, to supplier relationships,” confides Walukas.

Walukas also highlighted many of the supplier quality initiatives that are being implemented to continue the company’s drive to improve quality, reduce costs and enhance communication within the supply base. These include efforts aimed

at all facets of the vehicle life cycle, from product creation and volume production to the warranty process.

Supplier Quality—“Fundamentals Plus E-Tools”

Chrysler Group incorporates a combination of basic business fundamentals coupled with the benefits of e-tools as the foundation of its supplier quality efforts. Through product execution and the consistent delivery of parts, quick problem resolution and training are all a part of the day-to-day focus that the supplier quality group orchestrates with its suppliers.

One aspect has been the recent implementation of aggressive joint-training efforts. These quarterly sessions titled “Supplier Training Weeks” include over 25 courses offered by Chrysler Group to its suppliers. All courses are focused on Chrysler Group’s procurement and supply value drivers of quality, cost, delivery and technology and are the same classes that Chrysler Group has set up for its own employees. To date, more than 2,000 participants from 1,800 supplier locations have gone through the classes.

Chrysler Group is in full rollout of its e-AQP strategy, using a software tool called “Powerway.com,” which also will allow suppliers around the world to use one standard, web-based environment for advanced quality planning (AQP). Over 85 per cent of Chrysler Group’s Tier 1 suppliers have adopted Powerway.com and are using it today. Starting with the 2004 model year, all Chrysler, Jeep and Dodge vehicles will benefit from the e-AQP process and the use of Powerway.com.

During the volume production phase of a vehicle’s life cycle, the supplier quality group’s role is to provide ongoing, perpetual reviews of supplier performance. If a supplier develops performance issues, a Supplier Quality Development Process is implemented. During this review, Walukas’ team of quality specialists conducts a series of steps in order to jointly work with the specific supplier to improve operations and overall parts quality. Over 140 suppliers have benefited from the Supplier Quality Development Process in the last 3 years, resulting in a 56 per cent positive impact on overall supplier quality ratings.

“Although we are more performance driven than in the past and have re-tooled the way we measure suppliers, our overall goals are still straightforward,” said

Walukas. “It’s to work with suppliers to improve quality, lower costs, ensure on-time delivery of materials to plants and vehicles to dealerships, develop advancements of new technologies and improve the two-way communication between Chrysler Group and the supplier community.”

“Those suppliers that meet or exceed our performance requirements will have the opportunity to grow their business at a faster rate than in the past, especially when you consider the combined purchasing spend among all DaimlerChrysler business units.”



Figure 4.1 Covisint logo

Covisint: Innovation personified

Covisint is the vehicle to connect the auto industry in a virtual environment to enable speed in decision making, waste elimination and cost reduction while supporting common business processes between manufacturers and their supply chain.

Covisint is the central hub where original equipment manufacturers and suppliers of all sizes come together to do business in a single business environment using the same tools and user interface, with one user ID and password.

Covisint has been designed with an emphasis of making information accessible and visible within a secure online environment. Your information is secure within Covisint and you remain in control of who sees and accesses the information.

Founded by DaimlerChrysler, Ford, General Motors, Nissan, Renault, Commerce One, Oracle and PSA Peugeot, Covisint’s vision is building an online environment enabling individual enterprises and the automotive industry to achieve the

following goals:

- 12–18 month vehicle deployment cycle.
- Compressed order to delivery cycles.
- Greater asset efficiency and utilization.
- Higher profitability with direct impact to the bottomline.
- More integrated supply chain planning.
- Reduced business process variability.

Covisint is one of the successful innovations with over 8,000 registered customer companies in 2 years. Over 64,000 active users are connected and have conducted over 3,300 online bidding events. It has over \$82 billion in auction transaction volume throughput and has over 400 online catalogs. The site also has a lot of general information to keep its members updated and current. (Information used with permission from Covisint).

JIT II

JIT II was a great innovation in itself. The thought that a supplier will take over the procurement process of the material he is supplying and will station himself in the buyers' company was very revolutionary. Those were the days when customers and suppliers shared anything but good relations. And in such times talking about delegating decision making to the supplier was frowned upon. But the whole philosophy was extremely innovative and offered tremendous benefits to the companies. JIT II is nothing but a supplier relationship technique that empowers a supplier within a customer's business to buy, plan, change orders and design, along with other activities. The benefit is that the customer will be able to leverage the expertise and capabilities of their suppliers while the supplier will fully understand the customer's business and be an insider, every salesman's dream!

It has been said that JIT II is a technique that facilitates an overall business improvement strategy. The following are some of the highlights and benefits that

any organization can get by implementing JIT II:

- Leverage company's limited resources with JIT II alliances.
- Build trust and goodwill that will enable co-operative strategic planning.
- Maximize the benefit of relational value (information flow) with suppliers.
- Increase efficiencies by creating a "preferred" or "certified" supplier programme.
- Improve the effectiveness of supply chain initiatives with a JIT II approach.
- Bring suppliers into the early design phase for improved time to market. This is important as 50–75 per cent of the cost of a product is determined at the product design phase. Hence, it definitely makes a lot of sense to involve the suppliers at this stage as they can offer insights into ways to reduce the designed cost as nobody else can be as knowledgeable about the product as them.

VENDOR-MANAGED INVENTORY (VMI)

VMI started off as an innovative experiment. But now it has become an industry standard. VMI is a means of optimizing supply chain performance in which the manufacturer is responsible for maintaining the supplier's inventory levels. The manufacturer has access to the supplier's inventory data and is responsible for generating purchase orders.

Under the typical business model when a distributor needs a product, they place an order against a manufacturer. The distributor is in total control of the timing and size of the order being placed. The distributor maintains the inventory plan. While in VMI, the manufacturer receives electronic data (usually EDI or via the Internet) that tells him the distributor's sales and stock levels. The manufacturer can view every item that the distributor carries as well as true point of sale data.

The manufacturer is responsible for creating and maintaining the inventory plan. Under VMI, the manufacturer generates the order, not the distributor. VMI does not change the "ownership" of inventory. It remains as it did prior to VMI.

The benefits of VMI are numerous for both manufacturer and distributor.

Some benefits are common to both. They are:

1. Smooth information flow between the vendor and the manufacturer due to computer communication reduces data entry errors, thereby improving the speed of the processing.
2. The main focus of VMI is on the end user and having the correct item available for him when he needs it. This is a beneficial situation for all the parties concerned and involved.
3. A true partnership is formed between the manufacturer and the distributor. They work closer together and strengthen their ties. This partnership can then be harnessed in several ways and for several future projects.
4. VMI also helps in systemizing the whole process. For example, it stabilizes the timing of purchase orders which can be generated on a predefined basis.

DISTRIBUTORS' BENEFITS

1. Distributors' productivity improves as he achieves an improvement in fill rates from the manufacturer and to the end customer. This naturally decreases stock-outs which automatically decrease the inventory levels.
2. Planning and ordering cost will decrease due to the responsibility being shifted to the manufacturer.
3. The overall service level is improved by having the right product at the right time.
4. The manufacturer is more focused than ever in providing great service.

MANUFACTURERS' BENEFITS

1. Visibility to the distributors' point-of-sale data makes forecasting easier. Also the accuracy of data increases leading to more accurate forecasts and subsequent decrease in bull-whip effect.
2. Promotions can be more easily incorporated into the inventory plan.
3. A reduction in distributor ordering errors (which in the past would probably lead to a return of stock).
4. Visibility of stock levels helps to identify priorities (replenishing for stock or a stock-out). Before VMI, a manufacturer had no visibility to the quantity and the products that were ordered. With VMI, the manufacturer can see the potential need for an item before the item is ordered.

COMPANYWIDE INNOVATION

Implementing company-wide innovation requires a holistic approach to the situation. Companywide innovation has to come from the top. Leaders of the company should take on the responsibility of creating and harnessing an "innovation" atmosphere in the company. Everybody, that is, each and every employee of the company should have the desire to do his work innovatively. These innovative leaders not only define the innovation vision for their company by articulating it in words but they model it in their daily behaviour. As Peter Drucker wrote way back in a 1988 Wall Street Journal essay: "The final requirement of effective leadership is to earn trust, otherwise there won't be any followers and the only definition of a leader is someone who has followers."

LOGISTICS INNOVATION

Outsourcing of logistics function has been the latest buzzword. This is definitely an innovative method of implementing a distribution system. More details on this activity are being discussed in a later chapter.

MANUFACTURING INNOVATION

Single minute exchange of dye (SMED) or the flexible manufacturing system (FMS) have been some of the innovations in manufacturing.

PRODUCT INNOVATION

Product innovation can pertain to any one of the following areas:

1. Innovative manner in which an existing product is made. This results in improved quality or lower cost or enhanced features. A customer gains from this innovation. An example here is a computer. Every couple of years (months maybe!) a latest version of microprocessor chip comes in the market with added features and lesser cost to the customer. Companies like Intel and HP have been frontrunners in introduction of new versions of microprocessor chips. By introducing the ink jet printer, HP has become a market leader in the low-end printing business.
2. Innovation that has the capability of bringing an altogether new product in the market. A product that did not exist and for which, customers now see value in buying and using the product or service. A classic example is the Internet. We were surviving fine without Internet some 10–12 years ago but now we have become completely dependent on Internet for everything whether it is the ubiquitous application, e-mail or for plain surfing.
3. Innovation can be in the way in which an existing product is being offered to the customers. This has more to do with a service innovation but the ultimate winner is the product. Bundling of products and services can be an example in this category. When you bundle two products, two supply chains travel parallel and converge onto the same customer. For example, Filmfare magazine has been offering sops in terms of free product with every issue of the magazine. This is an innovating way of luring the customer. Innovation is not in the product but in the manner in which the product is being offered to the customer.

SERVICE INNOVATION

Service or customer service has seen several innovative approaches over the past several years. From a simple service innovation like free home delivery to catalogue buying, customer service has come a long way. Offering these or some other extra services to the customer requires companies to be completely ready to face any demands on its systems by the customers. More importantly, good service is not good enough for a true service leader. Service leaders focus on details and nuances of service. They see opportunities in small actions that competitors might consider trivial. They believe that the way organizations handle these little things sets the tone for the way in which it handles everything else. They also believe that details of the business add up for customers and make the difference. All of this puts additional strain on the companies. How can companies cope with this additional pressure? Through innovation. World class companies are today talking about having a service chain that runs along with the supply chain. This is definitely an innovative approach and can provide a definite competitive edge to the companies.

CONCEPT OF SERVICE CHAIN

Supply chain exists to fulfil the demand of the end user every time he wants the product. Supply chain is one that connects the various echelons that help reach the customer desired product to the end user. The service chain exists with a single motto: “Don’t sell to customers: Help them buy the product.” Supply chains are said to be the carriers of product, information and cash. Service chains take over from supply chains after the product is made available to the end user.

Supply Chain + Service Chain = Complete Customer Satisfaction
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Supply chain delivers the product to the customer while service chain takes care of his satisfaction by monitoring his use of the product, problems, issues arising thereby and handling of such exigencies. Service chain can ensure complete customer satisfaction and repeat orders. As is often said, it is cheaper to get current customers to place orders rather than finding new customers. Service chain takes care of this. An ideal service chain is one that is established by the manufacturer

along with the distributor and the retailer. The most common mistake that companies make is defining the quality themselves and then making all the effort to adhere to the so-defined quality. That is not quality but merely conforming to company specifications. Quality is defined by the users, i.e. the customers. Companies should just try to adhere to the standards as required by the customer.

Companies need to establish a service quality research process that provides timely, relevant trend data that managers become accustomed to using in decision making. Companies need more than just a service quality study. They need a deeper insight and understanding of the pattern of change. Hence companies should strive to build a service quality information system that uses multiple research approaches to systematically capture and disseminate service quality information to support decision making (See Figure 4.2).

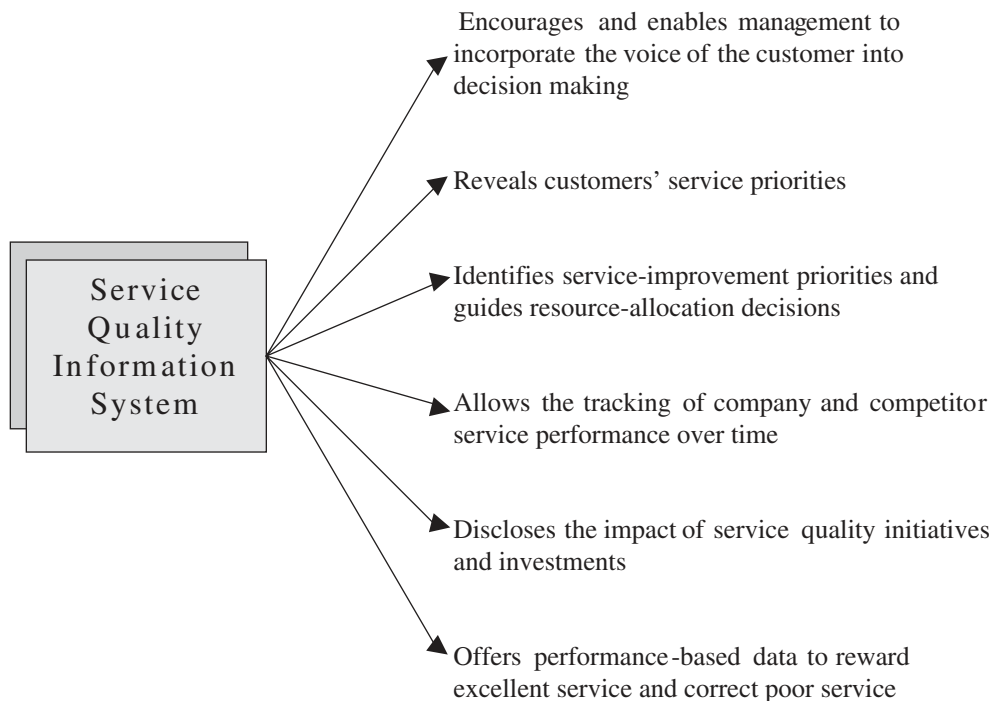


Figure 4.2 Principal benefits of an effective service quality information system

(Above Exhibit has been used from the book "On Great Service: A framework on action" by Dr Barry Leonard with permission)

TECHNIQUES OF VALUE ANALYSIS AND VALUE ENGINEERING

What is Value Analysis?

It is an orderly and creative method to increase the value of an item. This “item” can be a product, a system, a process, a procedure, a plan, a machine, equipment, tool, a service or a method of working. Value analysis, also called functional analysis was created by L.D. Miles. Value analysis approaches and techniques will help the persons involved to obtain a better answer to their problems that determine costs; in competitive business, this difference can change the organization from being just “good” to being the “winner”.

The value of an item is how well the item does its function divided by the cost of the item (in value analysis, value is not just another word for cost):

$$\text{Value of an item} = \text{performance of its function/cost}$$

In other words, a product or service is generally considered to have good value if it has appropriate performance and cost. An item that does its function better than another, has more value. Between two items that perform their function equally well, the one that costs less is more valuable.

Value analysis is a problem-solving system implemented by the use of a specific set of techniques, a body of knowledge, and a group of learned skills. It is an organized creative approach that has for its purpose the efficient identification of unnecessary cost, i.e. cost that provides neither quality nor use nor life nor appearance nor customer features. When applied to products, this approach assists in the orderly utilization of better approaches, alternative materials, newer processes and abilities of specialized suppliers. It focuses on engineering, manufacturing and purchasing attention on one objective—equivalent performance for lower cost. Having this focus, it provides a step-by-step procedure for accomplishing its objectives efficiently and with assurance.

When applied to services, this approach assists in the more precise determination of “What are we trying to do?” in the form of solvable problems, a thorough collection and penetrating analysis of information and assumptions surrounding the

service, viable alternative from the creative mental processes, with skilful sorting and development of better approaches from the “judgment” and “development” parts of the problem solving system.

Value analysis approaches may assist all branches of an enterprise—engineering, manufacturing, procurement, marketing and management—by securing better answers to their specific problems in supplying what the customer wants at lower production costs. Quite commonly, fifteen to twentyfive per cent and very often much more of manufacturing costs can be made unnecessary without any reduction in customer values by the use of this problem-solving system in the significant decision areas.

PARTNERS IN INNOVATION

The first stage is “idea generation”. Idea execution and implementation comes next. It is a long process converting an idea into reality. According to the survey conducted by Accenture “many of the organizations surveyed have a plethora of promising ideas—most of which were not commercialized. “Yet discovering the valuable ideas that are customer relevant is not easy,” feels Ajit Kambil, an associate partner and a senior research fellow at the Accenture Institute for Strategic Change who spearheaded the survey. Ideas can come from anywhere. The survey also featured a section on people who play a valuable role in helping companies innovate? The results were as follows:

Valuable External Partners

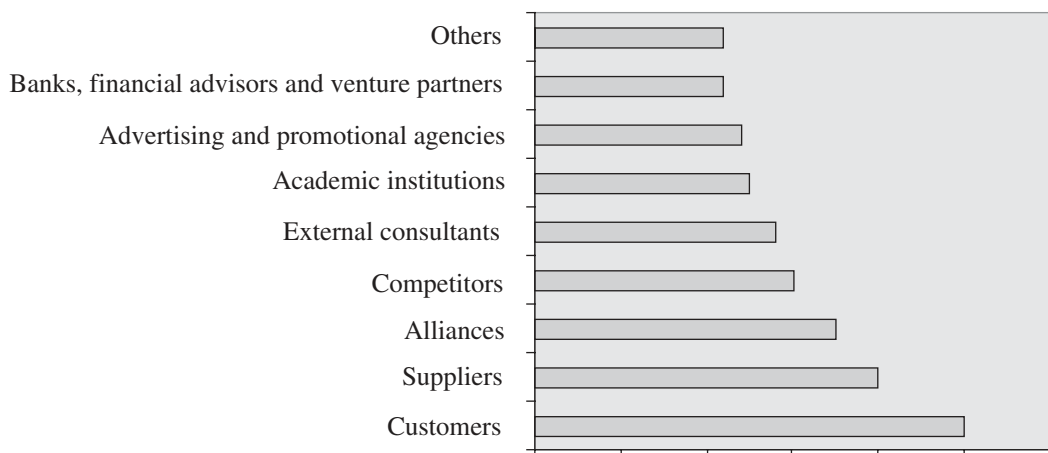


Figure 4.3 Various partners who play a role in innovation

The company, and specifically the CEO, should breed a culture that encourages innovation. CEOs can do that by having an innovation-oriented approach that encourages and rewards ideas. Such ideas and their creators should be freed from day-to-day chores to invest time in finding implementable solutions.

Drivers of Innovation

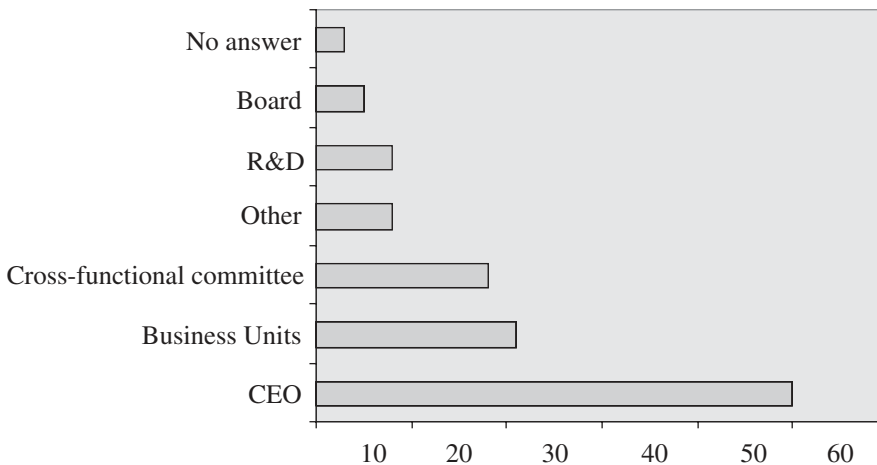


Figure 4.4 Various drivers of innovation

(The survey results have been used with permission from Accenture.)

Innovation Network, a leading company that works in the area of innovation, has formulated an Innovation DNA—a roadmap to creating and implementing innovative strategies. Their DNA Model describes that the operational elements of innovation consists of the following seven dimensions:

Challenge: Innovation, by definition, means doing things differently, exploring new territory, taking risks. There has to be a reason for rocking the boat, and that's the vision of what could be the challenge. The bigger the challenge and the commitment to it, the more energy the innovation efforts will have.

Customer Focus: All innovation should be focused on creating value for the customer, whether that customer is internal or external. Interaction with customers and understanding their needs is one of the best stimulators of new possibilities and the motivation for implementing them.

Creativity: Everything starts from an idea and the best way to get a great idea is to generate a lot of possibilities. While creativity is a natural ability of every person, the skill of developing a lot of ideas and connecting diverse concepts can be enhanced through training and exercise. It is up to the leadership to provide the direction and stimuli to spur creativity.

Communication: Open communication of information, ideas and feelings is the life-blood of innovation. Both infrastructure and advocacy must exist in an organizational system to promote the free flow of information. Organizations that restrict this flow risk atrophy and even death.

Collaboration: Innovation is a group process. It feeds on interaction, information and the power of teams. It is stifled by restrictive structures and policies as well as incentive systems that reward only individual efforts.

Completion: New innovations are projects that are successfully realized through superior, defined processes and strong implementation skills—decision-making, delegating, scheduling, monitoring and feedback. And when projects are completed, they should be celebrated.

Contemplation: Making objective assessments of the outcomes, benefits and costs of new projects is essential. Gleaning the lessons learned from both fruitful and failed projects builds a wisdom base that creates an upward cycle of success. Documenting and evaluating projects is a critical step that helps perpetuate innovation.

A wonderful example of innovation and using ideas effectively is Sodexho Services, the largest provider of outsourced food and facilities management around the world. The manager of a corporate cafeteria happened to notice the chairman of the company standing in a long check-out line. He was determined to find a faster way for people to pay for their lunches. On his way home he passed through a highway toll booth and suddenly a connection was born. How could he let people pre-pay for their lunch and completely avoid the check out line? This connection led to “E-Z-Pass,” a pre-pay process that is getting rave reviews from customers.

Oticon, a Denmark manufacturer of hearing aids, is a company with no departments, no titles, no offices, no paper. What it does have is a total project orientation, giving employees an extraordinary degree of freedom in choosing projects

that interest them, and the ability to develop new products faster than any of their competitors.

At the Neenan Company, a Colorado commercial development company, mistakes and “learnings by experience” are so valued that they have a giant gong in their lobby which employees hit when they would like to tell the rest of the company of their learnings.

(Information used with permission from Innovation Network)

(<http://www.thinksmart.com/mission/practices.html>)

A leading IT company in Mumbai realized that at any given point of time only 80 per cent of its employees are working out of their office, the rest 20 per cent are either travelling or working from home. Given the high real estate prices in Mumbai, it was not advisable to build an office that would accommodate all the 100 per cent of its employees. The company anyway was in the IT area and was having paperless operations. An innovative idea of creating a place only for 80 per cent of the people who can then log in from anywhere in the office and work was born. The company saved a considerable amount of money in the process.

Companies which earn 80 per cent of their revenues from new products typically double their market capitalization in 3 years according to a PwC study. Growth companies that make innovation a priority are on a faster track than the rest. And those dedicating a higher level of commitment to innovation are growing faster yet, the survey further said. “While it is clear that innovators are winners, it should also be noted that businesses making a high commitment to innovation where it penetrates throughout the organization are even better performers,” found the survey. “Of the 75 per cent of growth companies making innovation a priority, 36 per cent have done so to a great extent, while the other 39 per cent have made a lesser commitment. Those with the more-extensive commitment have grown revenues 16 per cent faster over the past five years, and they expect to grow 24 per cent faster over the next 12 months.”

(Information used with permission from PwC.)

“The more original a discovery, the more obvious it seems afterwards,” said Arthur Koestler. For example, “Fred Smith came up with the idea of an overnight

delivery service while he was a student at Yale. His business professor, the United States Postal Service, UPS, and almost every expert in the US said that such an idea would never work. Fred Smith is the Founder of Federal Express.”

In 1937 Chester Carlson invented the process of making photocopies, called “xerography” at that time, from the Greek words *xeros* for “dry” and *graphos* for “writing”. Almost every company Carlson approached, including General Electric, IBM, Kodak, RCA, and many more, along with the experts, said the idea had no merit. Why? Because no one in their right mind would buy an expensive copy machine when carbon paper was so cheap, plentiful and convenient. The company that eventually recognized the importance of Carlson’s machine came to be known as “Xerox”. Of the estimated \$150 million that Carlson earned from Xerox, he had given \$100 million to charity by the time he died suddenly in 1968.

CONCLUSION

Innovation, importantly an ability to implement innovation, is rare and should be respected. And the challenge for companies over and above keeping an eye on big competitors is to pay attention to the innovators. Innovators have the ability to change not only the rules of business but alter the very nature of business.

CASE STUDY

Gujarat Cooperative Milk Marketing Federation (AMUL)

Innovation is the process of turning ideas into manufacturable and marketable form.

— *Watts Humphrey.*

WHY AMUL

Amul means “priceless” in Sanskrit. Amul products have been in use in millions of homes since 1946. Amul Butter, Amul Milk Powder, Amul Ghee, Amulspray, Amul Cheese, Amul Chocolates, Amul Shrikhand, Amul Ice cream, Nutramul, Amul Milk and Amulya have made Amul a leading food brand in India. (Turnover: Rs 25 billion in 2002). Today Amul is a symbol of many things: Of high-quality products sold at reasonable prices, of the genesis of a vast co-operative network, of the triumph of indigenous technology, of the marketing savvy of a farmers’ organization, and of a proven model for dairy development. Amul or the Gujarat Co-operative Milk Marketing Federation (GCMMF) is probably one of the best cases where the raw material as well as the finished product is perishable. GCMMF as the name suggests is born out of a co-operative movement started way back in 1946. As many as 2.2 million farmers supply the raw material, i.e. milk. The advantages are probably that the raw material supply is assured, come what may, but on the flip side whatever happens to the finished goods market, raw material has to be procured and used up in the stipulated period. GCMMF is one of the rare stories, where a projection about both finished product sales and raw

material supply has to be done and on the basis of the results production has to be planned. It is one of the very unique and rare cases where production is a function of both raw material supply and finished product demand.

BACKGROUND

Inspired by Sardar Vallabhbhai Patel and executed by Morarjee Desai, a handful of farmers formed the Kaira District milk co-operative (KDMC) in 1946. About 250 l of milk collected daily from the farmers of two village co-operative societies was pasteurized and sent to the Bombay Milk Scheme. An assured demand for milk encouraged more and more farmers to join the milk cooperatives. For the next seven years there was no looking back. The co-operative movement was growing rapidly and then suddenly in 1953 there was a setback. Bombay Milk Scheme refused to accept all the milk supplied by KDMC in the winter season when the milk production is optimum. The surplus milk was then disposed off to middlemen at the lower prices, product being perishable in nature. But the legendary leader of the farmers, Tribhuvandas Patel, and the professional manager, Verghese Kurien, rightly converted this setback into an opportunity. Within two years of this incident, a dairy plant was built with powder and butter manufacturing capacity. There was no looking back.

New products were added, the brand name Amul was created and milk co-operatives on the lines of Anand were formed in other districts of Gujarat in quick succession. In 1973, a need was felt to professionally market the products being packed at several dairy plants in the state and GCMMF was born. The growth process continued and the Anand pattern became a benchmark. The National Dairy Development Board (NDDB) initiated Operation Flood all over the country wherein the Anand pattern was getting emulated all over the country. Over and above formation of milk co-operatives and empowering the farmers, it includes breeding, feeding, milk collection, cattle management, disease control, nutrition, milk processing and product manufacture and marketing.

Though co-operative in nature, GCMMF is run like any other corporate company with professional managers running the show. In 1994 when all over India, quality and TQM philosophy was being implemented, GCMMF was one of the frontrunners. With the twin pillars of customer focus and continuous improvement,

GCMMF introduced the concept of TQM. The concept encapsulated a wide array of philosophies including employee involvement, waste reduction, problem solving techniques and improvement of the processes, together with continuous training.

Kaizen (small improvements in or around one's work area) Programme was launched in May 1995 to improve employee participation and increase a feeling of belonging. A lot of innovative ideas and suggestions came from this exercise. Soon after this, a house-keeping initiative was undertaken to improve cleanliness and orderliness but above all for prompt retrieval of information or material. This was followed by '*Hoshin Kanri*', which means a methodology for strategic direction setting. It provides a step by step planning, implementation and review process for managed change.

The process to excel, to change and to manage change effectively has become a continuous process at GCMMF.

SUPPLY CHAIN MANAGEMENT AT GCMMF

Some 2.2 million[†] farmers from 12 districts of Kaira (Kheda), Sabar Kantha, Baroda, Panchmahal, Rajkot, Bharuch, Mehsana, Banas Kantha, Surat, Ahmedabad, Valsad and Gandhi Nagar reach the milk collection centres everyday in the morning and afternoon to sell the milk their buffaloes have given in the morning and in the noon. The total milk procurement in the last year 2002 was

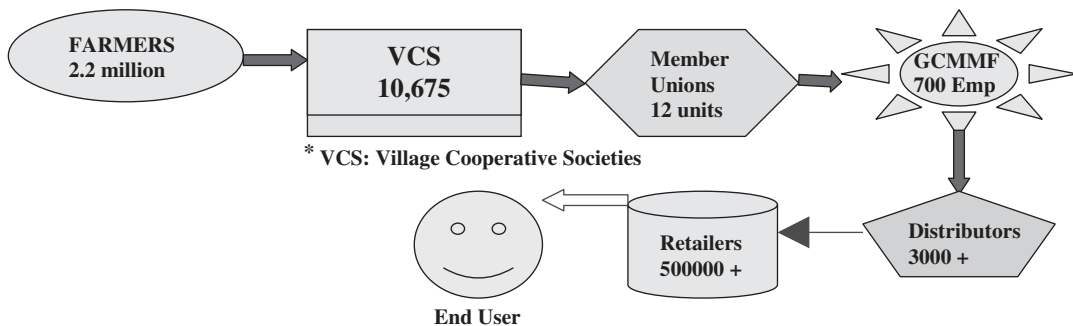


Figure 4.5 The flow of materials and information at AMUL

[†] These numbers were at the time of going to press.

an average 47.32 l per day where the peak procurement touched a high of 62 l. All the milk procurement centres are equipped with computers and electronic milk testers (EMTs). EMTs ensure efficient testing and measurement of milk constituents. The computers run the automatic milk collection system, which ensures immediate preparation of milk payment bills, transparency of operations and greater efficiency of milk collection.

The milk is then sent to the chilling depots in each village of the member unions. There are 10,852 villages under GCMMF and each one has a Village Cooperative Society. VDC also runs the automatic milk collection system. The milk is then sent to the 12 member unions. All of them run an ultra modern dairy that processes this raw material, which has travelled from faraway villages to the district headquarters. The various products made under the flagship of AMUL such as butter, milk powder, cheese, ice cream, Masti Dahi, paneer, Mithaimate, ready-made foods such as gulab jams, pizza and now kadhi are manufactured at these various plants and distributed through the various distributors across the country and abroad through GCMMF.

Snapshot of GCMMF

Members: 12 district cooperative milk producers' unions.

No. of producer members: 2.23 million.

No. of village societies: 10,852.

Total milk handling capacity: 6.7 million litres per day.

Milk collection (total – 2001–02): 1.67 billion litres.

Milk collection (daily average 2001–02): 4.59 million litres.

Milk drying capacity: 510 metric tons per day.

Cattlefeed manufacturing capacity: 1450 metric tons per day.

The entire operation is very smooth and done in the most professional manner. *SCM is at its best.* Every echelon is controlled with the use of ultra modern

facilities and appropriate use of information technology. At every stage at GCMMF, the officials concerned can not only check the milk procurement for that hour and day but also at the same time keep complete controls on the distribution and ultimate sales. To summarize in a few words, GCMMF is innovation personified.

Best and Innovative Practices followed for achieving SCM Excellence

1. **Branding and advertising of the product.** GCMMF has won half the battle here. The “Taste of India” slogan is adequate to propel the patriotic feelings of the customers to buy the products. The advertising campaign that features the Amul Girl and centres on the current situation or political problem evokes a tremendous response. This is extremely innovative and has made Amul stand apart from all the products across different product spaces. For 30 odd years the Utterly Butterly girl has managed to keep her fan following intact. So much so that the ads are now ready to enter the Guinness Book of World Records for being the longest running campaign ever. The ultimate compliment to the butter came when a British company launched butter and called it Utterly Butterly, last year. Created in 1966 by Sylvester daCunha, then the managing director of the advertising agency, ASP for Amul butter, the campaign was an instant clincher. From selling 1,000 t a year in 1966 to over 25,000 t a year in 1997, Amul’s success is far too phenomenal.
2. **Codification of raw material in an easy to understand manner.** Raw material codification is an extremely vital area often neglected. Proper codification is the basis for an efficient and smooth information flow throughout the system. Be it knowledge about how much is available and where is it available to who has supplied the raw material to where will it be used and when. So much information is dependent on this vital data. For GCMMF, raw material is milk and suppliers are the owners of milk producing animals, which are not one or two but 2.2 million of them. Hence it is essential to codify all of these farmers to keep the information generated by them under control such as the amount of milk supplied, problems if any, payment due, payment due date, etc. GCMMF follows a

very simple process which is not only easy to understand for all concerned but most importantly for the suppliers themselves. Each farmer is affiliated to a village cooperative society (VDS), which in turn is a part of a member union. Hence each farmer's house number along with the VDS number is the code for each farmer. This keeps it simple and short. Maybe it is simple for Amul in the sense that they do not have too many types of raw materials and many suppliers per raw material, as is typically the case with many manufacturing organizations. But the supplier base for Amul is huge and the raw material supply is twice a day and most importantly the quantity supplied per farmer can vary between morning and evening. The variation is so big that it is important to capture every bit of information. Efficient and simple codification helps take care of such cases.

3. **Payment to the milk suppliers on time and whenever they need it.** Supplier satisfaction on account of proper timely payments is one of the most essential aspects of relationship building. The best practice is to have so much trust in your supplier that after he has supplied the material pay him as and when he needs it in the form he needs it. Of course, this should be in agreement with the policies of your company. But the crux lies in framing policies that can allow such flexibility into the system. Amul is one completely flexible organization in this respect. Initially the payment to the farmers used to be once a day, then they demanded twice a day and then they wanted once a week and then once a month. Amul complied with all their demands and as a result they have one big happy family wherein each member feels comfortable in the relationship. Monetary comfort in terms of getting what is due on time and when required immediately puts the relationship on a different plane. This way, each and every link submits completely to the relationship. This is definitely a best practice not very commonly practised.
4. **Quality checks at every level.** Automatic quality checks at all levels right from collection from the farmers to the manufacturing of the finished product ensures that quality remains standard at all the stages through which the product moves. The most innovating and best practice followed by Amul is to eliminate the very reasons of quality upsets. Why should a bad quality product originate in the first place? Provide systems and

methods that will only produce good quality. Quality at Amul does not only mean product quality but also service quality. The company is equally concerned about the quality of service provided by the distributor and the retailer. For this purpose, nearly 200 Amul Quality Circles have been created for the federation's wholesale dealers across the country who meet every month to discuss and improve upon the distribution initiatives of federation.

- 5. Educating suppliers about things that improve the quality, i.e. eliminate the root cause for disruptions in quality. The process of taking TQMs to the farmers and involving the main echelon in the process of improvement and growth reaped rich dividends for Amul.**

Implementing quality and other best practices followed within the organization is something everybody is doing. Best practice lies in taking these practices to all others involved in the supply chain, that is involving everybody associated with the organization directly or indirectly. Amul has done just that. They not only implemented TQM within their own organizations but also took the concept to all those farmers who daily supply the raw material, i.e. milk.

A cross-functional team identified the major concerns, which if tackled can improve productivity and increase efficiency. A village level survey identified improvement of sanitation, improvement of milk testing, developing modern and systematic budgeting, business planning system and improving animal feeding practices as the major issues.

Due to the large supplier base, implementing solutions to these problems was a cumbersome task. More than 934 internal consultants were trained and developed to cascade the quality improvement initiatives right across hundreds and hundreds of villages.

For continuation of these activities and to ensure that this initiative did not become a one-time wonder, a proper system was put in place, which included regular review meetings at all the levels, i.e. at the village level, at member union level and at GCMME, cleanliness audits as per the format, etc.

The achievements have been astounding and encouraging. Milk collection centres have undergone a facelift, viz. the approach, the ambience and the enclosure. Everything has changed. There was a huge reduction in the visible dirt earlier carried through milk. The above interventions have significantly improved the quality of milk in terms of acidity and sour milk, microbiological quality that improves the shelf life of pasteurized milk and milk products. There has also been an improvement of artificial insemination services. The best part of the process is the encouragement meted to continue the housekeeping initiatives taken by the suppliers in the form of cash awards.

Ultimately who has benefited from this entire process? Suppliers and most importantly Amul.

Hence the **best practice lies in not only improving self but also extending this practice to all concerned and associated with the operation.**

6. **Business process ownership throughout the supply chain.** At every stage of the supply chain there is a complete ownership of the activities performed by the various echelons. They make an attempt to optimize their operations at their level. By ensuring speed and quality at all the levels and stages in the supply chain, they improve the overall performance of the supply chain and make it more customer-focused and customer friendly. Out of the bonus earned by the District Cooperative Societies, *Gurni* (nylon filter) and *Burni* (aluminium container with lid) in 4–10 l capacity was distributed which has considerably reduced the dirt which used to be found in the milk. Wholesalers and retailers too share this sentiment and actively participate to contribute their bit to the success of the overall supply chain. The business process ownership concept is so deeply entrenched within GCMMF that all employees constantly endeavour to improve the environment in which all of the echelons and links operate. For example, one of the key processes critical to the success of Amul's business is timely delivery of goods from the branch warehouses to the premises of the distributors located both in the local town where the branch is located as well as outside towns. Since as per the system the distributor remits funds in advance for the goods required by them, the greater the speed of this second leg dispatches (as it is commonly referred to), the faster is the rotation

of funds by the distributor, and as a result, the higher is his return. Hence it has always been the company's endeavour to reach goods to the distributors within the shortest possible time. A detailed analysis was undertaken to understand the current system, the problems, the challenges and the issues that need to be addressed. The result of the efforts was a one-third reduction in the time required in second leg deliveries.

7. Using technology optimally including using wireless sets to communicate with the veterinary doctors as and when needed by the farmer.

Software programs to ensure smooth functioning of routine operations is a common practice but what makes Amul special is the use of other high technology products such as wireless sets and other items to communicate with the essential services and send across vital information.

Suppliers, i.e. the farmers are located across various villages, some very remote. The distance used to prohibit these villagers from ensuring timely medical help for their cattle stock resulting in untimely deaths or spread of disease. Wireless sets were the natural solution and the member unions helped the VCS to buy these sets. Now timely intervention of a veterinary doctor have not only reduced the incidence of death but have resulted in overall improved health of the cattle stock even in remote villages. Hence the best practice lies in going to the root and ensuring that the raw material is produced in the best possible way.

8. Concurrent engineering: breeding and cross breeding of animals for better milk production.

The breed of the animal has a direct correlation with the quality and quantity of milk produced by that animal. This process helps not only in increasing the yield but more importantly quality yield. Needless to say the quality and quantity of raw material is directly proportional to quantity and quality of the finished product. This best and innovative practice involves addressing the problem at the core.

Artificial Insemination is one of the best methods of improving the breed of the animal. Suppliers (or Farmers) need help in this process as they not

only need the information but even the actual cross-breeding process cannot be accomplished by them alone without any support.

9. Use of Internet for exploring the unknown terrain.

Amul.com is not only a brochure or an information site that talks about the company and its products, but it is an experience in itself. Amul Cyber Store sells around 49 different Amul products including butter and cheese to Dhara oil. Orders can be given online and there is a free home delivery within municipal limits of the city. Payments are to be made on delivery and an Amul representative will confirm the order over telephone before sending the delivery. Amul ice creams are sold through another cyber store which allows you to choose from the 28 different product categories available. Internet is also used to tap the export potential of the products. Already Amul products are available in countries like USA, Singapore and Gulf countries. A form is available on the site which can be used by customers outside India to order Amul products. Overall the Amul site and its customer friendly features are a treat for a cyber surfer. The bright yet soothing colours on the site give a good feeling. The site, though full of pictures and gifts is fast to download and navigate.

10. Information technology integration and widening the reach of IT at village level.

Amul is currently running an enterprisewide integrated application system which will now be web enabled. This will empower its supply chain management and make it more customer focused. GCMMF has already been honoured for its IT excellence by the award of Top CIO 2001. These awards are given in the areas of SCM and Customer Management.

Since the federation was founded, member unions have introduced modern technologies at the village level in order to optimize milk collection efficiency and extend milk production enhancement services. This has included such innovations as installation of wireless sets in villages for rapid communication access to veterinary health assistance and switching

to electronic milk testers to ensure efficient testing and measurement of milk constituents of. Starting 5 years ago, VDCS have also taken the lead in adoption of computerized “Automatic Milk Collection System”. This has helped to ensure immediate preparation of milk payment bills, transparency of operations and greater efficiency of milk collection.

Almost 4,000 VDCS already have installed these computers. It is planned to equip almost 8,000 of the VDCS with computers by 2003–04. The company is also exploring possibilities of integration of these village-level computers with the mainframe through network connectivity, creating an interactive system for two-way flow of information between federation, unions, co-operatives and their owner members. This is undoubtedly a best practice.

11. Active customer feedback and incorporation in product improvement.

When Amul launched curd under its brand name Masti, it became an instant rage. It became difficult to match demand. For the first time in India, a daily needs item was being sold through an organized set-up under a well-known brand. The salient features of this product are that it is made in the most hygienic way in a modern processing plant and with special culture to give a smooth, mild acidic taste and pleasant flavour consistently. Everything was going smooth until an active customer gave a feedback on the shelf life of the curd. The Amul team immediately reciprocated and started working on increasing the shelf life of the product. Masti Dahi shelf life was improved from 3 days to 7 days on the basis of this customer feedback. The best practice lies in not only being open and responsive to customers and their feedback but more importantly acting on and satisfying them. Innovation lies in taking R&D to the masses and incorporating “what they say”.

12. Active customer feedback for increasing product lines.

“Customer is the king”. Amul not only says this but actively practices this. As mentioned in the previous point, product innovation was brought about on the basis of active customer feedback. New products were also introduced on the basis of customer feedback and what they

want from Amul. An all-India survey was conducted wherein customers were asked: what other milk products Amul should produce that they would like to consume? An overwhelming number of customers voted in favour of ice cream. Amul's foray into the ice cream market was completely governed by this survey. This was in January 1997. And within a year of its launch it attained over 20 per cent market share in Mumbai alone. Now within 6 years since its launch, it has already become the market leader. With 33.42 per cent of the market share, Amul is around 5 per cent ahead of its nearest rival Kwality Walls (HLL). The best practice lies in finding out what the customer wants and acting accordingly. Amul is a classic example of this innovative practice.

13. Active involvement of employees of GCMMF in all activities of the member unions.

GCMMF is like an umbrella organization to whom all the suppliers and their cooperative societies at all the levels look up to for support, help and guidance. GCMMF in turn participates in the activities of the suppliers and their cooperatives. They do not interfere and intervene only when required. This ensures a healthy relationship between all parties concerned.

The best practice is to be closely involved with the supplier and their groups if any, which can benefit all, concerned. The supplier benefits by the wide experience of the manufacturer and an understanding of where and how the raw material he is supplying is being used.

14. Closer and deeper relationships with the business associates, i.e. with the wholesaler.

Amul Yatra for wholesalers and distributors and also for C&F agents is a regular feature. This helps not only in improving relationships but an overall understanding of each other's processes. The wholesaler dealers get to see and understand the Anand Pattern, the cooperative movement. This also helps in imbibing a sense of belongingness among the wholesalers. And the feeling that "this is mine and I can contribute effectively to making this successful" can work wonders to the productivity of the

wholesaler. The wholesalers also get to meet each other, interact with each other and share problems and challenges, concerns and comforts. This has helped improve productivity tremendously.

15. **Implementing globally proven philosophies such as Kaizen, Hoshin Kanri, which is a Chinese word meaning a “Methodology for Strategic Direction Setting”, etc.**

Globally several ideas and philosophies have been implemented with great fervour. *Kaizen* as we know is a culture of sustained continuous improvement focusing on eliminating waste in all systems and processes of an organization. The *Kaizen* strategy begins and ends with people. With *Kaizen*, an involved leadership guides people to continuously improve their ability to meet expectations of high quality, low cost, and on-time delivery. *Kaizen* has the capacity to transform companies into thinking companies which will always give them an edge over their competitors. Amul implemented *Kaizen* with great gusto, where each and every employee participated with equal enthusiasm. Several innovative solutions were found to everyday problems due to *Kaizen*.

Hoshin Kanri is a system of forms and rules that encourages employees to analyze situations, create plans for improvement, conduct performance checks, and take appropriate action. In practical application, however, it is much more than forms and rules. *Hoshin* is a philosophy of management! Amul used this technique to make the employees more participative and to inculcate a problem solving approach. Since the last 6 years GCMMF has successfully conducted biannual policy deployment, or *Hoshin Kanri* workshops for all its departmental heads and branch managers to share vision, mission and goals and to develop and review action plans.

16. **Implementing small group activities (SGA) to select and understand the problem and come up with counter measures, which are then tested, standardized and internalized in the company.**
17. **Completely in tune with the ground reality an enquiry is initiated on the organizational climate. This gave details about the core**

competencies and most importantly gave details about the handicaps and inadequacies.

18. Have recognized “Change” as an essential factor governing business needs and hence incorporates change in every form at every stage. Employees, suppliers and distributors also “Change Ready” always.
19. Recognized the importance of housekeeping and implemented the Japanese System or ‘5S’ principles to create a process and internalize in the company. Implemented a process of regular housekeeping audits by cross-functional teams.

Based on Japanese words that begin with ‘s’, the 5S Philosophy focuses on effective work place organization and standardized work procedures. 5S simplifies work environment, reduces waste and non-value activity while improving quality efficiency and safety. Sort – (Seiri) the first S focuses on eliminating unnecessary items from the workplace. Set in order (Seiton) is the second of the 5Ss and focuses on efficient and effective storage methods. The third S is shine (Seiso). This step encourages to thoroughly clean the work area. Daily follow-up cleaning is necessary in order to sustain this improvement. The next S is standardize (Seiketsu). Standardizing best practice in the work area. This includes allowing employees to participate in the development of such standards. And finally after all this sustain (Shitsuke). This is by far the most difficult S to implement and achieve. Human nature is to resist change and more than a few organizations have found themselves with a dirty cluttered shop a few months following their attempt to implement 5S. The tendency is to return to the status quo and the comfort zone of the “old way” of doing things. Sustain focuses on defining a new status quo and standard of work place organization. Once fully implemented, the 5S process can increase moral, create positive impressions on customers, and increase efficiency and organization. Not only will employees feel better about where they work, the effect on continuous improvement can lead to less waste, better quality and faster lead times, any of which will make your organization more profitable and competitive in the marketplace.

Amul is one of the few companies in India to implement this wonderful method of ensuring a clean and sanitized work place. All the employees

follow the principle with a great motivation. Forget the manufacturing facility where eatables are made, even the office where planning and organization takes place is extremely hygienic and clean.

20. **Self-managing leadership course for all federation and GCMMF employees presented by Brahmakumaris at Mount Abu. The best practice does not lie in doing the course but learning from whatever source possible proven/unproven but helpful and implemental.**

Self-Management leadership (SML) is an advanced self-management development program for those who have to lead others during a period of transformational change. It is designed for integrating the different priorities and responsibilities in your life—work, family, health and fitness, community and personal self-development; clarifying your focus in life—your personal purpose, values and vision, life goals and directions; learning how to focus your mental energies and developing the willpower necessary to bring about the changes you want in your behaviour and habits; developing the authentic communication skills, clarity and self-esteem necessary to inspire and help others empower themselves.

The entire top rung of Amul, including the Managing Director Mr Vyas attended this course at Brahmakumaris World Spiritual University at Mt Abu. As mentioned, the best practice is a constant zeal and motivation to improve oneself. And to achieve this one must undertake all possible routes.

21. **Strong committed leadership which is directly involved in everything that is happening.**

Amul has been extremely fortunate in this matter. It has got the best from the country. Dr Kurien who as Chairman and B.M. Vyas as the Managing Director are great visionaries and equally great implementers.

Starting from a humble beginning with focus on society and people at large, Amul or GCMMF has travelled a long distance. Innovation is the key and following globally proven best practices will in no time place Amul in a different league altogether. This is a classic case of how innovation breeds excellence and hence a robust bottomline.

(With inputs from H.P. Rathod and Sanjay Panigrahi from GCMMF, websites, newspaper articles and other research reports.)

(Though AMUL is the brand name of GCMMF, it has been used throughout the Case Study as it is more recognized by that name)

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Customer Focused Supply Chains

A customer is the most important visitor on our premises. He is not dependent on us. We are dependent on him. He is not an interruption of our work. He is the purpose of it. He is not an outsider to our business. He is part of it. We are not doing him a favour by serving him. He is doing us a favour by giving us the opportunity to do so.

— *M.K. Gandhi.*

“Customer is the undisputed king” is the mantra of this century. Customers now have the capacity to make or mar the prospects of products and hence businesses. The biggest change in the customer’s behaviour is that today he goes to the market to buy a product and not a particular brand, which makes inter-brand competition very severe and puts tremendous pressure on supply chain management. When a customer buys a product and not a brand, it poses several challenges to the manufacturer and the distributors to make the product constantly available to the customer, anticipating the need rather than reacting to the need. To add to this, competition has increased, which has led to an increase in availability of several options to the customer. Quality and price have ceased to be an issue; what matters is availability of the product when the customer wants it. To quote John Kasarda of Forbes: *“Manufacturers now compete less on product and quality—which are often comparable—and more on inventory turns and speed to market.”*

Product availability has been cited as the most vital ingredient in a “BUY” decision-making process. Needless to say the product will only be available if the supply chain works on time every time. Price is the second criterion. Once again this puts a lot of pressure on the structure of supply chain and the cost incurred as the product travels between the various echelons within the supply chain. How and from where is the procurement handled? Is the supply chain waste proof? How much inventory is to be handled in the chain? All the issues that can increase the overall cost of operation come under pressure.

Designing a supply chain that is robust yet sensitive, strong yet agile, exhaustive yet responsive is the key challenge today. Changing customer behaviour has had several repercussions on the functioning and working of supply chains. An attempt has been made to calibrate these repercussions and correlate them with the challenges that the manufacturer has to pose on account of these changes.

1. **Shortening Product Life Cycles:** Product life cycle management has emerged as one of the hottest and pet subjects for any manufacturer. It has proved to be the biggest challenges faced by companies world over today. Shortening of product life cycle coupled with increased competition has posed serious threat to the manufacturer. What is a good time to calculate product life cycle? Will my product have a short life cycle or will it be

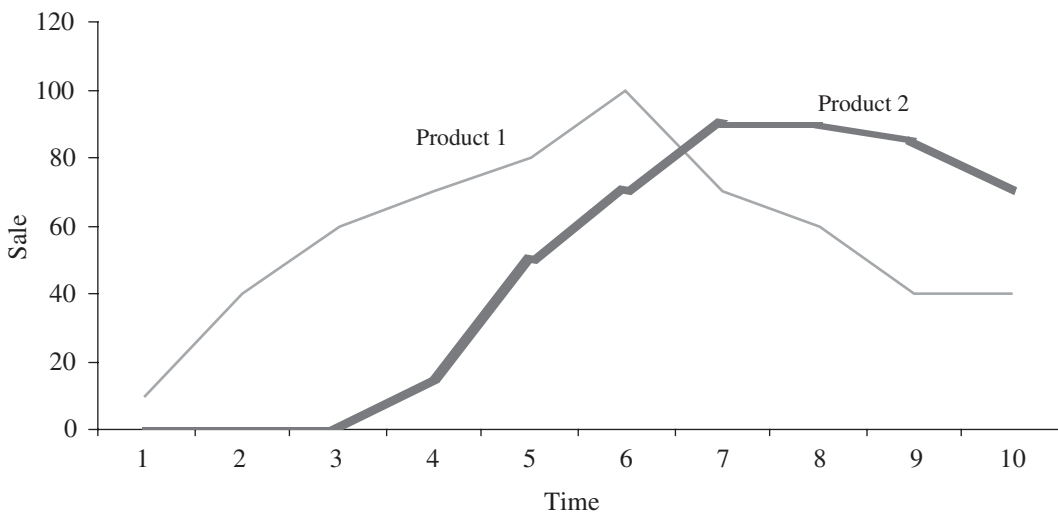


Figure 5.1 Effect of short product life cycle on SCM

average or long? When is it a good time to introduce a new product? These are some of the questions that the manufacturer has to contend with. And this is just one example of how moods, fancies and changing tastes of customers dictate businesses today. “Here today, gone tomorrow” has put tremendous pressure on company operations. While one product is in the market, it has become imperative for companies to design a new product and launch it in the market well before the first one slows or dies. This means that while one is still handling and operating and facing the challenges in the supply chain of the first product, the company has to start focusing on the second product and start handling and operating its supply chain. Figure 5.1 explains this phenomenon, even before product one has achieved its peak, company has already started work on product 2. It is in the company’s interest that product 2 achieves its peak before product 1 declines completely.

2. **Customization:** Gone are the days when customers would take whatever was given to them, in whichever form and colour. Customers today impose their tastes and preferences on the manufacturer. Customization as propounded by Michael Dell has had its impact on almost all products and industries. Customer interest in the product has gone beyond the apparent features of the product. Today he wants to dictate the manufacturing and raw materials used in the product. The computer industry is of course the most impacted. Customers design the PC they want to buy by choosing the hard disk, memory and other accessories. But even in the automotive sector, where apart from deciding the colour of the vehicle, customers today demand a particular pattern of steering wheel, a particular type of gear box and a particular variety of tyre and wheel. Similarly in FMCG, unitization is the answer to customization. Make the product available in all shapes and sizes and quantities. Customers can choose from a 10 ml sachet of shampoo to a 1 l bottle. Similarly, the construction industry also has to make several options available to the customer to choose from. Electronics and electrical products must offer several choices right from a walkman and a single radio to a two-in-one or a six-in-one.

All of this puts additional pressure on the supply chain. The manufacturer has to have a manufacturing set-up that is capable of making or building anything that the customer orders. But he should also have adequate

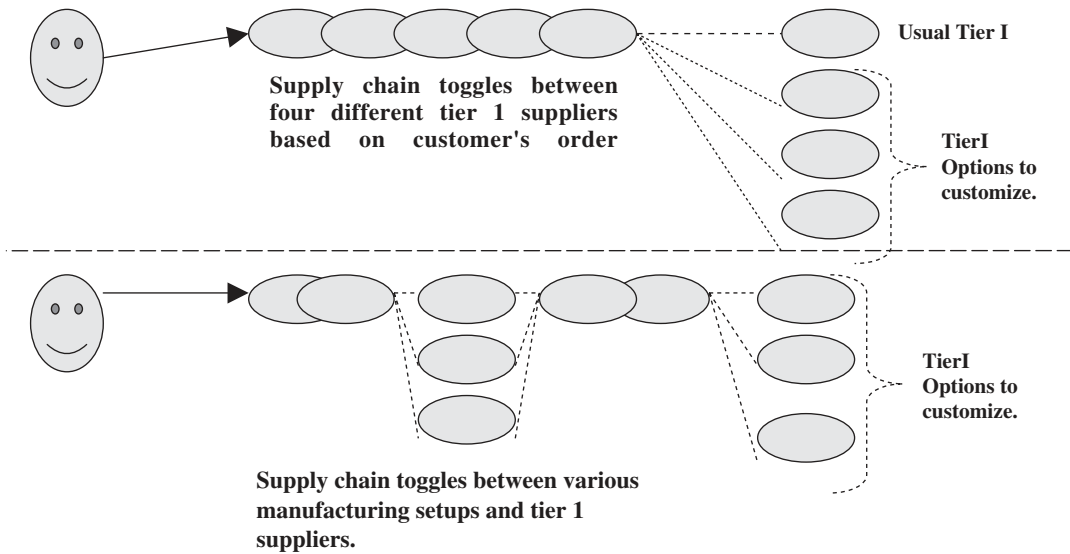


Figure 5.2 Toggling supply chain as an impact of customization

support from his suppliers and other business partners. Which means he need to line up suppliers (Fig. 5.2) even though he might not buy from them on a regular basis, except perhaps in circumstances when the customer demands a particular item or product.

Though the number of suppliers per material has decreased, the number of materials has increased because of customization (hence increase in total suppliers). This has increased the number of stock keeping units for the manufacturer. Needless to say, more the stock keeping units more are the manufacturing and distribution challenges. Customization has also made the manufacturer constantly innovate, seek constant co-operation from the suppliers and focus on R&D.

3. **Instant Availability:** The customer is never in a mood to wait. Whatever he wants must be available then and there. This once again puts a lot of pressure on the logistics capabilities of the company. Pushing inventory in anticipation on to the retailer who is the buying arm of the customer can unnecessarily create excess inventory. And keeping less number of products can on the other hand result in lost sales. **Lost sales are viewed as a**

supply chain failure. According to a survey, at any given point of time “more than 20 per cent of the shoppers don’t buy because the goods they want are not there”. Their dissatisfaction is more acute when the goods they are seeking are being heavily promoted in the media. It is a very peculiar situation for companies to be in. The toughest job is to anticipate and forecast the exact demand. This has made companies introduce a daily and sometimes twice-a-day dispatch schedule which clearly is very stressful for companies. Typically the following system is adopted by most of the companies.

Of course, variations are bound to happen in this schedule as illustrated in Figure 5.3 as customer demand or “pull” from the retailer by the customer will fluctuate. But these aberrations are tackled separately and incorporated only if they become a routine. Hence distribution has become one of the prime activities in a manufacturing company. Another vital role that distribution plays is that of information carrier. The vital information on customer preferences and buying behaviour can be effectively captured if the distribution is tuned to do that. Communicating this information in the appropriate systematic format is another vital activity that distribution needs to perform. Service vs. inventory is the great tug of war constantly taking place in any manufacturing industry.

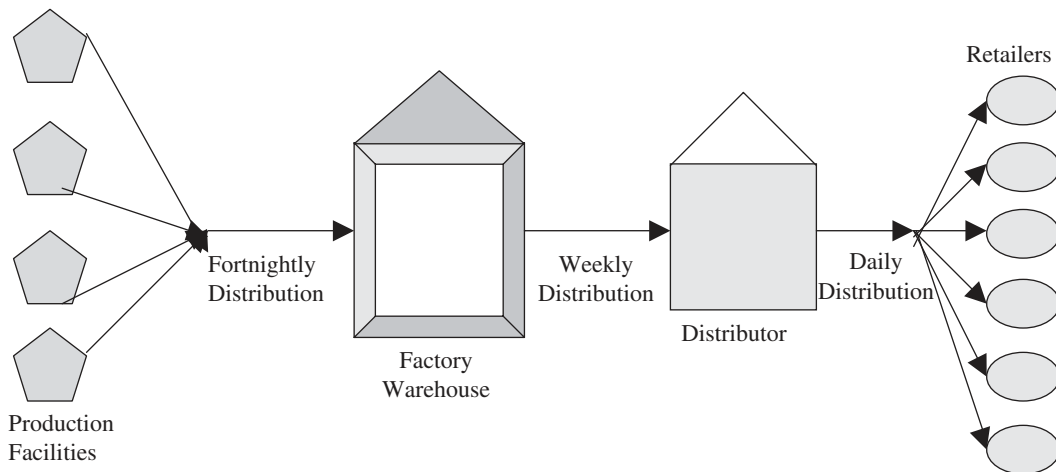


Figure 5.3 Most popular SCM design

4. ***Capturing Customer Behaviour:*** Anticipating or forecasting what the customer wants and making it available to him when he desires is the most vital agenda for CEOs. Stock availability for the customer when he wants is no longer an issue related to operational efficiency but overall brand and positioning issue and hence a supply chain challenge. Customer buying information has become so vital that it has moved up the organizational hierarchy from sales and marketing to manufacturing to the CEO and strategy. Until recently supply chain planning was steeped in historical statistics and algorithms which could predict customer behaviour. But today, customers do not conform to historical stereotypes: they are more demanding, less predictable, more influenced by fashion and media and most importantly more impulsive and take the buying decision on their feet.

All of this has changed the way supply chain planning and forecasting is done by companies. Historical data is used to make the annual plan which is then broken down into monthly schedules and plans. But actual supply is done based on immediate sales records and instantly this information is used to modify the next monthly production plan. The whole process has become extremely dynamic and constantly requires actual data in real time. Similarly, the monthly schedule is communicated to the supplier so that he readies his facilities and for his planning and reference but he uses that data only when he gets a confirmed order which is made based on real time demand information. This puts tremendous onus on supply chain professionals who have to constantly change and alter the plan. The fallout of improper planning is inventory about which lesser said, the better.

5. ***Fashion, Style and Comfort Conscience Customer:*** Colourful, small and trendy is the “in thing”, whether it is mobile phones or electronic gadgets or consumer durables. This necessitates engineering innovations. Innovations cannot be accomplished in isolation. It requires adequate support from all business partners in terms of participation and collaboration. R&D has hence become a focus area. Return on investment in R&D can only be realized when the product gets launched and garners sales and market share. It is a long process and needs ample inputs from market regarding customer tastes, attitudes, etc. Once the design is ready, suppliers and other key business partners need to get together to create the product accordingly.

SUPPLY vs. DEMAND: THE GREAT TUG OF WAR

Supply first or demand first, push or pull are like the chicken or egg problem. Companies the world over are fighting this tug of war. There is no readymade solution. Within the same company, different solutions might exist for different situations. The immediate repercussion is inventory. Globally companies have been very sensitive to the issue of inventory but despite that it has become a big menace. Recent estimates from the US Commerce Department indicate that in the United States, \$1.1 trillion in inventory supports \$3.2 trillion in annual retail sales. This inventory is spread out across the value chain, with \$400 billion at retail locations, \$290 billion at wholesalers or distributors, and \$450 billion with manufacturers. With this large stock pile, stock outs or non availability of stocks should logically be very low.” But that is not the case. Studies have shown that 8.2 per cent of shoppers, on average, will fail to find their product in stock. These stock out events represent 6.5 per cent of all retail sales. Even after recouping some of the loss with sales of alternative product, retailers will suffer net lost sales of 3.1 per cent. This takes an enormous toll on retail margins, not to mention customer goodwill.

India is no different. According to a recently conducted survey, the following are the inventory figures in average number of days of gross sales. These figures are equally or probably more horrifying.

Inventory	Average (no of days of gross sales)
Raw material	33.41
Packing material	20.91
Work-in-progress (WIP)	14.25
Finished goods	16.09
Goods in transit (GIT)	6.44
Accounts receivables	46.51
Accounts payables	45.00
Inventory at CFAs/DCs	14.48
Inventory at distributors	16.77
Inventory at retailers	13.48

So the million dollar question is where does the problem lie? When there is no dearth of supply, why is there a problem regarding good and satisfactory service? The problem obviously lies in understanding when and what the customer wants and designing the supply strategy accordingly. This means that the chain should start from the customer and not the other way round. BTO concept propagated by Michael Dell revolves around a similar concept. A peep into the basic operations of Dell gives a tremendous insight into how a customer facing chain can help companies perform better and save cash. One lesson that can be learnt from the statistics given above and the Dell story given below is that *service and customer satisfaction is not a function of inventory or sales and revenues are not a function of marketing and production*. Ultimately what is important is capturing customer order and satisfying it diligently without a single miss.

Dell Model: (Dell Computers Headquarters in Round Rock, Tx USA)

Salient Features

Geographical Details

Name of the plant: OptiPlex Plant

Area: 200,000 sq. ft. (enough to enclose 23 football fields)

Number of employees: Less than half a dozen manning the computer terminals.

Financials

Revenue: \$2.3 billion on sales of \$31.9 billion

Online Sales: \$16 billion (50 per cent of its total sales)

Feather in Dell's Cap

Turn-around time: A single order of hundreds of computers can be built, customized and sent out in as much as 8 h and as little as 6 h if it's a rush job.

Inventory data

Number of hours of parts on hand at any given point of time: 2 H

Space used up for storing incoming parts: 100 sq. ft.

Product inventory: Zero (PCs and servers are on the truck almost as soon as they come off the line).

Corporation-wide product inventory: 5 days (making an attempt to bring it further down to two and a half days)

Industry average: 50–90 days.

Customer's End

For Corporate Customers: Introduced Premier Pages in 1997 which is an electronic catalogue that allows corporate customers to purchase Dell machines over the web.

The Process: A customer pulls product information directly from Dell's server into the customer's purchasing system, which creates an electronic requisition. After the requisition is approved online by the customer, a computer-generated purchase order shoots over the Internet back to Dell.

Time taken: The entire process can take 60 sec.

Errors Reduction: Errors in its procurement processes have come down from about 200 per million transactions to tens per million.

Savings: \$40–\$50 off the cost of processing each order.

Software used: WebMethods, which creates a kind of hub that using the web allows instantaneous communication among companies' internal business systems.

Other Concepts used: Data warehousing, event tracking and demand shaping.

Suppliers End

Physically: Suppliers maintain hubs—mini-warehouses storing 2 weeks' worth of their Dell parts—near each Dell factory.

Electronically: Valuechain.dell.com that lets the suppliers know what Dell's needs are at any given moment, so they can plan their own production schedules accordingly.

Savings: Expected to see savings of \$150 million from Valuechain.dell.com by 2003, but by last year it had already surpassed that figure.

(Used from Dell website with permission.)

Insights into Demand

Being sensitive to customer requirements brings with it other advantages. The data on customers, their profiles, product preferences, current designs, etc. gets stored in Dell's data warehouse each time Dell takes an order. This data is mined and useful information on customer needs is generated. This information is then used to anticipate customer request, trends, or to alert customers about new hardware/software that they might want to buy. Information is also passed on to its suppliers who can in turn adjust their own manufacturing processes or prices.

Rate of Dell's Growth

50 per cent larger than its nearest competitor and growing four times as fast.

CONCEPT OF DEMAND CHAIN

Aberdeen defines Demand Chain Management as the deployment of Internet-based sell-side solutions that automate manual order management processes, cut the costs of sales, increase revenues by extending market reach, and optimize multi-division, multi-channel branding and commerce initiatives.

Another definition of demand chain is: "A demand chain is a network of trading partners that extends from manufacturer to the customer." The various participants of demand chain are manufacturer's warehouse, wholesalers' distribution centres, retail chains' warehouses and retail outlets. A demand chain can include

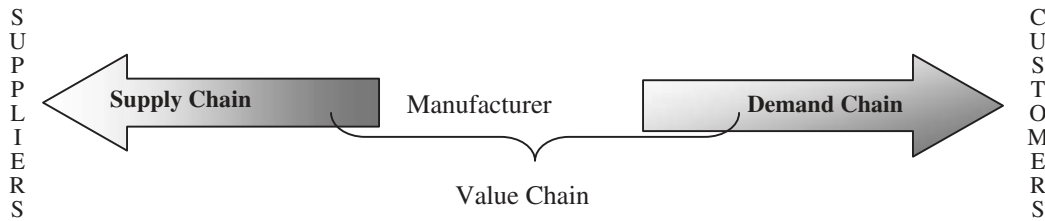


Figure 5.4 Definition and concept of Demand Chain

several business partners who are involved directly or indirectly in ferrying the finished product to the customer.

Dr Hau Lee of Stanford University feels that demand-based management will be the competitive battle ground for the 21st century. Demand-based management is critical to an enterprise in managing its supply chain, product development, technology strategy, service support and organizational design. Hence integrating demand and supply is the next big opportunity. Calvin Lee, Vice President and Chief Scientist at Non Stop Solutions feels that “Creating efficiency in demand chain requires art and science.”

SUPPLY CHAIN vs. DEMAND CHAIN vs. VALUE CHAIN

Supply chain as has been defined in the past is a chain of business partners that collaborate to serve the customer. This customer is the manufacturer’s customer. In 90 per cent of the cases, this customer is the distributor and in another 7–8 per cent it is the retailer. Rarely does the supply chain of a manufacturing company go beyond this. Figure 5.4 defines supply chain as the one that connects all the suppliers at all levels through to the manufacturer who converts the material into a product that can be taken to the market. Demand chain, on the other hand, connects the manufacturing facility to the customer, the end user. Value chain is the sum total of both of these chains and connects the first tier supplier with the end user. Thus value chain looks at every step from raw materials to the eventual end user—right down to disposing of the packaging after use. The goal is to deliver maximum value to the end user at the least possible total cost. This obviously makes supply chain as well as demand chain subsets of a value chain which has a broader perspective and focus.

EMERGENCE OF VALUE CHAIN CONCEPT

A couple of years ago manufacturing was concentrating on optimizing its own operation (each department was doing it at the cost of other departments) without trying to look at and attempting to optimize the external linkages. This was at a time when customers were passive and accepted whatever the manufacturer gave them. Also manufacturer had antagonistic and ugly relations with the supplier. As a result, there were too many suppliers for each raw material. The monopolistic manufacturer dictated the customer so much that “productisation” of the brand took place. Customers used the brand names for products. And brands became products. Figure 5.5 illustrates this situation where companies had a large supplier base on one side and were in a monopolistic situation, hence could garner a large customer base on the other side.

The customer revolution took place wherein the customers became demanding and choosy. At the same time liberalization and globalization increased competition. All of this decreased market space. Customer’s side shrunk and the manufacturer had to fight for every customer and every order.

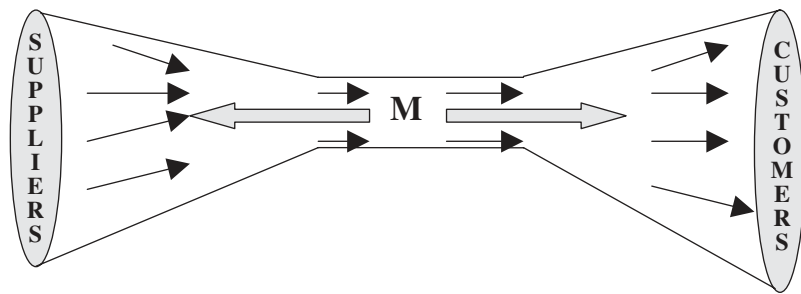


Figure 5.5 Everything was aplenty

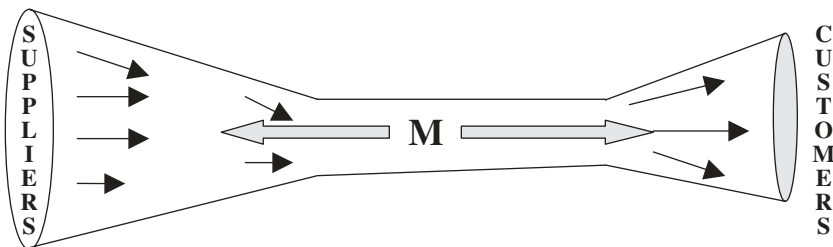


Figure 5.6 Shrinking customer space made an ugly looking chain

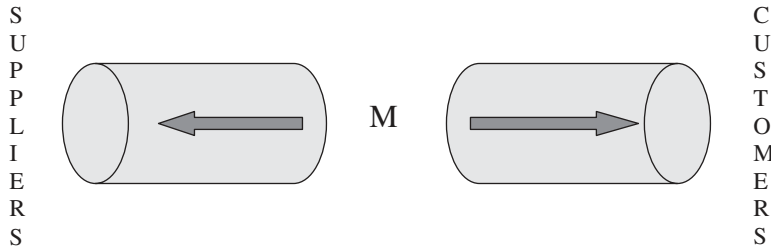


Figure 5.7 Supply chain and demand chain (extended supply chain) in action

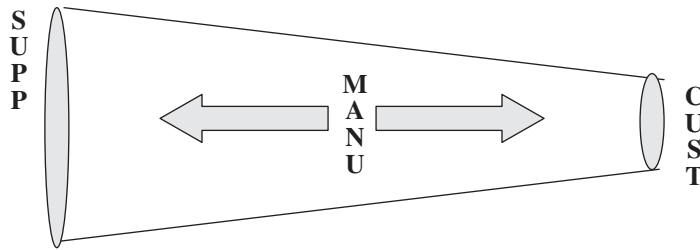


Figure 5.8 Current situation where the products effortlessly flow into a narrow nozzle

In Figure 5.6 one end of the chain is narrow while the other end is broad. It puts a lot of pressure on the manufacturing company. The fallout is material congestion at the manufacturer's end resulting in increased inventory holding and locked in working capital. The immediate solution is to firm up and tone up the supplier's end. The market end is anyway out of control and beyond the purview of the manufacturer. From such a situation was born the concept and the philosophy of SCM. It became a priority to take complete charge of the chain that brought in raw materials inside the manufacturing facility. Customers became more demanding and the market shrunk further, creating the need to take the concept of supply chain beyond manufacturing into the actual selling activity. Manufacturers started calling these extended supply chains or demand chains.

The challenges and problems of Figure 5.7 have expanded as we can see in Figure 5.8 due to increase in the number of channels that the customers can use to make demands on the company. This definitely puts extra pressure on the companies to understand the different types of customers, their demands, their

requirements and their satisfaction levels. Value chain was born out of this need to have a system beyond supply chain and demand chain that is all-encompassing and brings in information and takes out product through each and every echelon of the chain.

TEN TENETS OF VALUE CHAIN

1. Value chain helps understand the super demanding customer who wants customized products, at lower prices, as fast as he desires and exactly in the quantity he wants.
2. Value chain supports companies to make them steady in highly dynamic and volatile supply and demand market.
3. Value chain smoothenes and improves the information flow through the different incompatible systems between various partners in the chain. This happens without any loss of vital information.
4. Value chain allows a peep into the future by providing exact information about each and every customer. Demand planning and future forecasting done on the basis of this will automatically result in decreased inventory and better cash-to-cash cycle ratio.
5. Value chain helps in product tracking and product follow-up which in essence means information on exact customer order status and information. Instead of tracking the suppliers and retailers or other echelons in the chain, value chain helps companies chase each customer order till it reaches him. This gives a broader perspective of the whole situation.
6. Value chain allows companies to exert better control on allied activities such as waste management, disposal of surplus or used material and other forms of inventories that can cause disruption in the overall functioning of the process.
7. Value chain helps understand the customer behaviour as against product behaviour. Customer behaviour is a much broader concept and involves perception of the customer regarding the product vis-à-vis competitor's product.

8. Value chain brings the supply side directly in contact with the buy side thus establishing a direct communication channel between them. This allows supply side to anticipate and accordingly prepare their resources.
9. Value chain empowers companies to efficiently manage crisis. Since information about everything and everybody is available in an organized manner, companies can act immediately when faced with a problem. Precious time and hence customer is not lost in the process. Value chain keeps the manufacturing company constantly geared up each time, every time.
10. Finally, value chain helps companies to grow and progress rapidly. This is possible as the company has better control on three of most vital ingredients of success: to know, to act, to decide.

CUSTOMER RELATIONSHIP MANAGEMENT

CRM as customer relationship management is better known is a software solution suite that allows companies to better understand and serve the existing customers, while enabling companies to acquire new, profitable customers. CRM has come a long way from inward looking to customer focused solution.

Evolution of CRM

Though less than a decade old, CRM has dominated the life of manufacturers. The evolution of CRM can be characterized by the following five waves:

First Wave of CRM:

- Began in the mid '90s.
- Inward focused.
- Single function (point solutions).
- Meant to support a particular group of employees (technical support personnel, the sales force, call centre representatives, or the marketing department).

Second Wave of CRM

- Integrated, 360 degree client-server system.
- Full suite of offerings with marketing/analytics, sales support, service and call centre functionality.
- Goal was to provide a single face to the customer by enabling employees to work from a common set of customer information.
- But still inward facing.

Third Wave of CRM

- Late '90s.
- Internet redefined customer buying behaviour and offered one more channel for the customer to buy from.
- Concept of customer self-service got built into CRM suite of applications.
- Birth of e-CRM.
- However, there was no integration across customer facing interaction touch points.
- Also customers could not get a full view of order position as there was lack of seamless integration within the enterprise.

Fourth Wave of CRM (current)

- Leverage internet architectures.
- Much broader CRM functionality.
- Wider reach that extends the reach of CRM functionality several employees, distribution partners and also to customers.

- Integration of all customer touch points, i.e. Web, call centre and other contact points.
- Integration of CRM with ERP and other back-end operational system.

Fifth Wave of CRM (future)

- Redesign business from customers, point of view.
- Emergence of CMR or customer-managed relationships.
- Give customers direct access to all of the information and application functionality they need.
- Complete integration that gives customers complete visibility into company's operations.

(Courtesy: An Executive's Guide to CRM. "How to Evaluate CRM Alternatives by Functionality, Architecture, & Analytics" by Ms Patricia Seybold. Used with permission).

SCM AND CRM INTEGRATION

Meta Group analyst Steve Bonadio feels that organizations can no longer afford to view CRM, ERM, and SCM initiatives as separate. Synchronizing front office, back office and supply chain activities is critical to attracting/retaining customers, fulfilling demand and improving cycle times.

Ed Daihl, President of Baan CRM, SCM and PLM business unit sees a lot of synergy between CRM and SCM. Citing an example where CRM meets SCM, he says: "We can take orders over the Internet, configure and price it, then tie that into our supply chain software that does advanced planning and scheduling and actually do the availability to promise. Then, to be able to ship that complex configuration and pricing into the ERP system and get it built as configured and offer it not only to direct sales force but to your channel partners is really where I see us going forward. That is a combination of products that have traditionally been in the CRM space that have also been in the supply chain space."

Customers now expect their relationships to be managed. They almost demand that companies know the background of a relationship and how it works. What they have learned to expect in the consumer world they assume will exist in the business marketplace. Good CRM software can provide this capability, but only if it's part of an overall package—a package that includes supply chain management and also ERP as well. Installing a CRM system that is not integrated in some way with SCM technology is counterproductive. Some companies are offering full suites of products that allow users to create seamless company-wide systems that include CRM, SCM, ERP and other applications.

JD Edwards which is a leading provider of CRM, enterprise asset management (EAM), ERP, SCM, and supplier relationship management (SRM) software recently commissioned a survey to find out what according to IT managers is most vital in achieving excellence in CRM.

Some of the findings of the survey are:

- Managers believe order fulfilment is the key to excellent customer service.
- Integrating CRM across their critical business applications enables managers to act fast to fulfil customer needs.
- The survey of more than 150 IT purchase decision-makers, conducted on behalf of J.D. Edwards & Company also highlighted the important role that integrated supply chain and CRM solutions play in quality customer service.
- Companies are eager to integrate their CRM and SCM applications.
- Three-quarters of the 150 respondents have either already integrated their CRM and SCM solutions (26 per cent) or plan to in the near future (49 per cent).
- They also are very aware of the customer benefits that come from successfully completing such a project. 91 per cent of respondents said it was extremely important or very important that back-end fulfilment systems have sufficient inventory to meet customer needs.

- Tailoring processes to the individual needs of the client or customer was extremely important to 49 per cent of respondents and very important to 42 per cent.
- Respondents cited the following customer satisfaction drivers as “very” or “extremely” important: Quality products (89 per cent), on-time delivery (85 per cent), knowledgeable sales personnel (83 per cent).
- Benefits to top-notch customer service, included business intelligence on customer needs and preferences (91 per cent) and increased fulfilment accuracy (78 per cent).

(Courtesy: JD Edwards. Reproduced with permission.)

CONCLUSION

Over the years, the concept of service has gained tremendous importance with companies investing heavily in implementing a service-oriented network. A good service or the lack of it can make or mar the prospects of the product, however good the product is. Mahatma Gandhi once remarked: *“The best way to find yourself is to lose yourself in the service of others.”* Though he generally talked about social service and service to people, this quotation can be aptly used to describe the current mental state of manufacturing organizations.

CASE STUDY

Asian Paints Private Limited

INDIAN PAINT SECTOR

The Rs 65 billion Indian paint market has been steadily growing at 8–10 per cent CAGR over the past five years. Despite such encouraging growth rates, per capita consumption of paints in India—estimated at 700–800 gms—remains one of the lowest in the world. Lower than countries like Malaysia, Thailand, Philippines and Sri Lanka.

The unorganised sector is a strong force in the paint industry and controls almost 35 per cent (an estimated 2500–3000 players) of the domestic market. A decade earlier the unorganized segment used to have a much higher share of the market. The reduction of excise duty from 40 per cent in the early 1990s to the present 16 per cent has reduced the significant advantage the small-scale manufacturers had over large companies. Another reason is that most of the players in the unorganized sector dealt with cheaper substitutes such as *chuna* or cement paints which customers are shying away from. The consumer has also become more brand and quality conscious. Nearly 50 per cent of market share in the organized sector lies with one single company—Asian Paints India Limited (APIL). Also APIL is almost double the size of any other paint company in India. Interestingly, there has been no new entrant in the last 5 years, giving an opportunity for the existing players to consolidate their operations and hence market share.

The Indian paint sector is also very curious from the point of view of the type of customers. Institutional buyers account for only 20–30 per cent of the demand and the rest being painters and contractors with negligible bargaining power.

Depending on its use, the market can be further classified into decorative paints and industrial paints. Industrial paints find application in general protective, powder/coil coatings, automobiles, marine paints, etc. while decorative paints or architectural paints are basically home paints, used largely in the household sector. House paints can be further classified into interior and exterior paints depending on the end use.

BACKGROUND OF ASIAN PAINTS

Asian Paints had a very humble beginning way back in 1942, when four young men got together to manufacture paint in a small garage in South Mumbai. In just 3 years, the company touched a turnover of Rs 350,000. Asian Paints hit on the innovative marketing strategy of reaching consumers in the remotest corners of the country with its small, conveniently-sized packs. Around this time, the company's mascot, the mischievous imp, Gattu, was born.

The decade beginning 1957 saw the most significant changes at Asian Paints. The company grew from being a family-managed, small-time paint manufacturer to a professionally managed organization that could compete with the best in the world. It was in the late '50s that the company's one-man R&D department figured out a way to produce international quality phenolic and maleic resins on its simple coal-furnace, with a hand-stirring process.

Meanwhile, the company embarked on an ambitious grassroots level marketing campaign, forming close bonds with thousands of dealers in small towns all over India. By 1967, the company had jolted its multinational competitors by emerging as India's largest paint company. Today, Asian Paints is close to twice the size of its largest competitor. But, much more important, it is considered one of India's "Most Respected Companies".

Asian Paints manufactures a wide range of paints for decorative and industrial use. Vertical integration has seen it diversify into specialty products such as Phthalic Anhydride and Pentaerythritol. Not only does Asian Paints offer customers a wide range of decorative and industrial paints, it even custom creates products to meet specific requirements. The company owns the strongest umbrella paint brand in the country, markets over 10 strong brands through its widespread distribution network of 70 sales offices and approximately 14,000

dealers. “Asian Paints currently ranks among the top 10 decorative coating companies in the world and the company vision is to be among the top five decorative coatings companies in the world,” mentioned S.S. Kini, Vice President—Supply Chain.

INTERNATIONAL OPERATIONS

Asian Paints operates in 23 countries across the world. It has manufacturing facilities in each of these countries and is the largest paint company in nine overseas markets. It is also India’s largest exporter of paints, exporting to over 15 markets in the Asia-Pacific region, the Middle East and Africa. In 12 markets it operates through its subsidiary, Berger International Limited and in Egypt through SCIB Chemical SAE.

ASIAN PAINTS—BUSINESS OUTLOOK

1998 can be etched into the company history books as a landmark year. The company drafted its vision of aiming to become the fifth largest decorative coatings company in the world. In order to achieve this target, several changes were made within the company. It re-engineered its operations (to make the processes seamless), aggressively implemented technology (for better information flow) and created a culture that empowered people to take decisions (based on strategic and financial impact) and hence responsibilities. Five key areas were identified that could help the company achieve this feat, viz. improved customer orientation, a penetrative and responsive distribution network, value focused R&D, material cost reduction and strong manufacturing capability.

First, the company innovated keeping the consumer in mind—Asian Paints focused on what the consumer wanted rather than what they could offer. Value for money was the proposition being sold, not in the context of an economy product but rather in the context that whatever you pay, you get good value for it, whether it’s the premium or the economy range of Asian Paints. Innovation has been the hallmark of the company. The company has continuously innovated in all its areas of operations. Besides its innovative product offerings the company has introduced new concepts like ‘Colour World’—Dealer Tinting systems, Asian Paints ‘Helpline’ & Asian Paints Home Solutions.

Second, the distribution network was identified as the critical area that the company should build. This was critical, as the multinationals did not have a distribution network outside of the main cities. Asian Paints worked on this aspect of putting in place a dynamic supply chain model and invested significant sums in technology and systems for the network. Today Asian Paints' supply chain model is well recognised by corporate India. Expansion of the dealer network was also critical to the company's success. This has resulted in today a strong dealership network of over 14,000 dealers that are serviced directly through their 70 selling locations.

Asian Paints R&D has formulated all the products for the company in the area of house paints. Product innovations have helped Asian Paints service the entire area of decorative coatings. Also, the company has been able to provide products across the price spectrum in each segment. This has helped the company tremendously. Hence at every single point of time it is innovation and uniqueness of the product offering that has led to the success of the company.

Materials contribute to about 61 per cent of the net net sales (NNS) of the company in 1997–98. Through aggressive sourcing initiatives and working with vendors, the cost of materials have been reduced substantially and the contribution of materials to NNS has been lowered to a commendable 57 per cent by 2002–03. These reductions have been passed on to the customers and have helped increase the market share of the company substantially.

The improved manufacturing capability of the company has resulted in the postponement of capital expenditure by at least 4 years and has helped further bolster the strong financial position of the company. Productivity has significantly improved and so has the asset turnover—the latter almost by 50 per cent over the last 4 years.

APIL—OPERATIONS

With over 3000 SKUs the supply chain at Asian Paints is very complex. (One SKU would mean specific product – shade pack combination, e.g. 1 l Apcolite Enamel Shade: Black would mean a single SKU.) Of these around 300–350 are fast moving with extremely high liquidity at the counter. The company also has the practice of adding around 2–3 new products in its bouquet each year, which would mean the addition of another 15–20 SKUs.

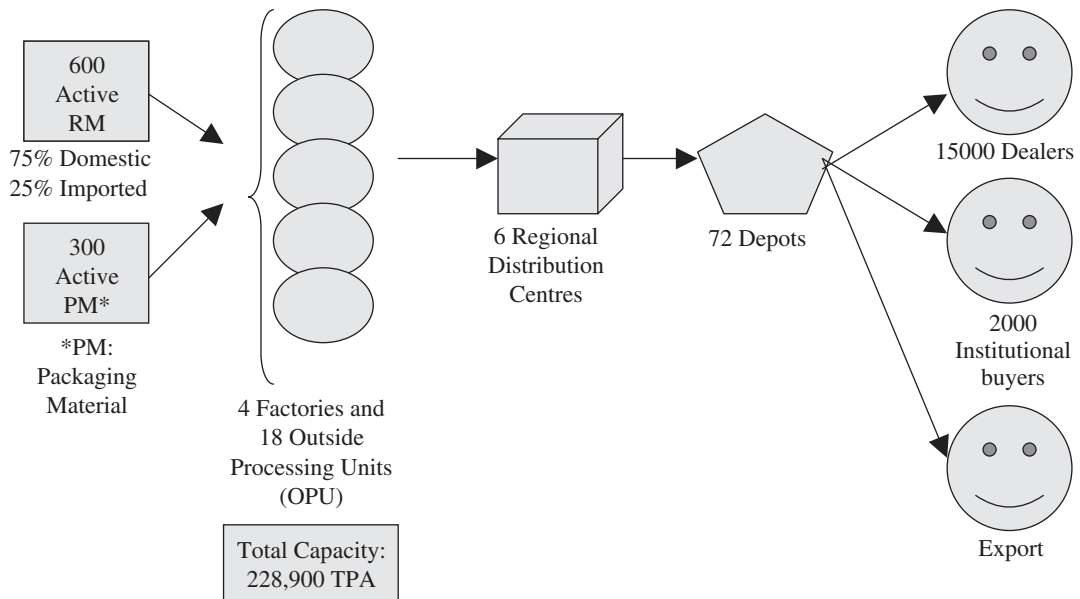


Figure 5.9 Asian Paints Supply Chain

CUSTOMER-DRIVEN APPROACH: CUSTOMER-FOCUSED SUPPLY CHAIN

“The entire Asian Paints supply chain revolves around what the customer wants,” says Soren Malekar, General Manager – Materials. He further added that brand restructuring has always been driven by market, customers and their needs. For example, the management’s decision to focus on Asian Paints as an umbrella brand with sub-brands, Tractor (distempers) and Utsav was a function of a market survey indicating the strong identification of the Indian customer with Asian Paints rather than particular brands. APIL has also changed its logo and packaging to give it a more lively, global and contemporary look.

APIL launched several innovative service-based initiatives to gain proximity to the end customer. These involve Home Solutions (a complete painting solution), Colour World (tinting systems) and Paint Helpline (an online customer support helpline).

Home Solutions is a complete service whereby APIL (through its authorized painters) undertakes the entire painting job on the request of the customer. The basic concept is to sell a “painted wall” instead of selling paint. Launched in Hyderabad in October 2000, the service has now been extended to the six metros and has received a good response—2,300 sites were painted under Home Solutions during H1FY03. This makes the customer happy and adds the benefit of dealing directly with the company.

Colour World is a user friendly, dealer tinting system (DTS) to dispense paints. These systems are essentially dispensers with an attractive user friendly front end. Based on the shade and base requirement of the customer, the machine creates the desired paint (out of over 1100 shades) using a combination of white (colourless) paint base and a range of colour tints. These formulae are stored inside a computer which controls the colourant additions. This machine gives exact quantities and uses colourants that are developed in-house by the company unlike DTS of other companies that have to use imported colourants. In fact, it is said that Asian Paints is one of the few companies worldwide that manufactures its colourants through indigenous technology. The DTS has helped Asian Paints provide over 1000 shades to their consumers for their existing products. This has helped reduce dealer inventory as the dealer has to now stock only bases and not the entire range of shades in various products. This has helped bring down the working capital of the dealer and he is able to rotate his capital much faster. Launched in 1998, the company today has more than 3,000 Colour World outlets.

Another innovation is its ‘Helpline’. The Helpline is toll-free number accessible from multiple locations across the country. The Helpline has been a great success. Asian Paints believes they have converted most of the calls into actual sales for the company. Once the caller agrees to view the paint options, the existing supply chain provides the services. It’s just the entry point into the customer supply chain that is different.

A customer friendly website with an online chat is another very innovative initiative aimed at targeting an IT- and Net-savvy customer. Extremely user friendly, easy to navigate and despite usage of heavy pictures and colours, can be easily downloaded. There is an option to check various colour possibilities in various rooms. The next step is to simulate a customer’s house and check how the room

will look in a particular colour. This can be done by scanning pictures of the customer's home and then using the software to check out various colour options. Then there is *Kavita* with whom customers can chat online and get all information they want about colours and paints that may or may not be available on the site. The website has continuously changed to keep its attractiveness.

Basically, the whole idea is to provide several entry points to the customer. And that every point in the business should synergize with supply chain. Asian Paints has brought in the element of modernity, speed and customer services without any significant increase in cost.

DISTRIBUTION—INITIATIVES (OUTBOUND LOGISTICS)

It is estimated that Asian Paints will have to carry nearly 25,000 tonnes a month of paint if its plans for the paints business go as expected in 2003–04. That's nearly 4,000 trucks a month criss-crossing the nation. Given that there are 3,000 SKUs and over 14,000 dealers who need servicing, Asian Paints' supply chain strategy needs to be very dynamic.

This puts tremendous pressure on forecasting, planning speed and accuracy of information flow. However, networking and a strong IT initiative were required to build a powerful forecasting system. For many years, APIL has been a pioneer of sorts in its innovative use of IT to enable its business processes and had an in-house developed software. The need was felt to upgrade to cutting edge IT and tie it in with the ambitious plans of the company. APIL was using a legacy software to manage the internal operations and the option, rather the industry norm, was to convert this first into using ERP and then implement SCM around this ERP.

It is normally believed that ERP is the basic building block for any further system, the integrator and the means to make data visible and on a shared basis. Conventional wisdom then said you could plug in optimizers to enhance the ERP data and thereby optimize your entire corporation. Asian Paints did the opposite.

Contrary to industry practice, Asian Paints installed the Supply Chain Trade Matrix suite before it implemented ERP. "This was because we felt our transactions

systems had the strength to support a state of the art supply chain management software and that would help us gain faster return on the IT investment,” opined Malekar. “At that time, we felt going in for an ERP would give us a good transaction system to integrate all our operations of the BUs and the joint venture, Asian PPG. We were happier pursuing the benefits of a decision support system, first. Also, we felt we should remove costs from our systems using the optimization engines and then plough that return into fresh IT investment.” “We could clearly see the tangible benefits of implementing an SCM solution,” he said.

The integration is now complete and the data that i2 suites need come from SAP and Asian Paints is one of the few companies, which is implementing all the SAP modules.

Asian Paints has implemented the SCM solution and is in fact the first company in India to have implemented the full suite of the SCM solution from i2 Technologies. Due to Asian Paints’ prowess in the area of supply chain management and the expertise that it has in this area, as the earlier SCM systems were completely developed in-house by the company, the SCM suite was significantly reoriented by Asian Paints to see that the solution meets all the requirements of the company. The various modules implemented are as follows:

1. Demand Planner (DP)

— This would help APIL to improve the demand management process thus reducing forecast error. In addition to historical data analysis, the tool also has the ability to combine that with data on historical causals for greater responsiveness.

2. Supply Chain Planner (SCP)

— Using the demand plans generated earlier, this tool allocates the production of products at a gross level across the manufacturing locations based on an optimization engine and aggregate planning techniques. This tool uses cost data to do an optimal allocation of stock as well as take basic decisions on inventory to hold at various points in the supply chain. It optimizes the customer service level vs. cost equation as the basis for inventory holding.

3. Factory Planner (FP)

— Post the master planning exercise done in the supply chain planner, this tool uses the proposed deployment plant to generate a week-to-week factory plan and proposes the procurement plan for all raw materials and packaging materials. It also, helps to plan for production of intermediates such as resins, emulsions, etc., and schedule material shipment (intermediates) across all manufacturing locations including outside processing vendors.

— With particular reference to the industrial and automotive businesses, it will allow these businesses to be able to order promising.

4. Optimal Scheduler (OS)

— This helps the plant to do shift-to-shift sequencing based on resource considerations and arrive at an optimal schedule which minimizes changeovers while optimizing throughput in the company-owned manufacturing locations.

The overall demand management process using demand planner has been changed from the earlier hierarchical model to a model based on the consensus. The process itself in addition to all the mathematical capabilities of the software further aids the improvement in forecast accuracy. The greater frequency of planning helps improve the responsiveness of the supply chain and allows the company to proactively service the market based on the latest market intelligence as supplied to them by their sales personnel in 70 field offices.

Going against a set standard has several repercussions. At first, ERP did not “talk” to the new SCM solution and a lot of data normalization had to be done. Data masters had to be matched and data reliability had to be cross-checked. There was, in effect, no common platform for data analysis or response. Data would take days to normalize and then its concurrency would not be certain. But over a period of time all of these issues were successfully overcome providing a seamless flow. “Our ERP system makes the SCM solution more successful,” asserts Kini. “We also have scalability in our operations, since databases have been rationalized and common, optimizers cut out unseen flab and real-time information will reduce chances of inventory pileups. Tracking of stock throughout the chain is another

advantage that we are looking for,” he adds. The software to have the ERP talk to the SCM solution was developed by the company. After the SCM solution was linked to ERP, the company has managed to get further benefits as now data was real-time, every time. This further brought some tangible benefits in terms of inventory count that is reflected in the company’s working capital numbers.

Asian Paints is today considered as one of the most networked and progressive Indian companies, having spent up to Rs 40 crore over the last 3 years on various levels and technologies. It understands very clearly that the key to sustained market leadership in the decorative segment will come through a relentless focus on the various components of its supply chain—from the vendors to the customers. “The upshot of this investment is much better inventory visibility, appreciation of working capital, which could be freed and, more importantly, the ability to take corrective action quickly to prevent the bullwhip effect as well as take advantage of market demands,” shares Kini.

“The visibility to the market demand has given us deeper insights in our operations vis-à-vis what the customers actually want,” says Malekar. This coupled with several projects and initiatives has helped deliver significant value to the customer. “For example, a lot of thinking and innovation went into designing and developing new and alternate packing material for paints,” he adds. The company has achieved significant benefits through material cost reduction. These savings are quite sizable.

“Similarly, with efficient use of the supply chain engine, we have managed to reduce working capital requirements by nearly 50 per cent in the last financial year. This has significantly helped increase cash flows for the company, which was around Rs 1,760 million in 2001–02. This enabled us to take the processes to a much better level than in the past,” feels Kini.

Another common challenge that any industry faces is how to improve service without increasing the cost of service, i.e. inventory. Usually it is very difficult to achieve a trade-off between inventory and service and in most cases companies opt for service and accept inventory increase as part of the business plan. Asian Paints through its consistent efforts has been able to achieve optimal service levels while controlling, in fact reducing inventories throughout the supply chain. And Asian Paints has proved that by lowering inventory also, it is possible to have a significant increase in

service levels. Working capital management is the key for a paint company and APIL had concluded that it had to work at lower inventories of all its inputs. Asian Paints concluded that the only way of doing this was by adopting the following, three strategies. Firstly, by investing heavily in IT, with the sole intention of getting visibility across the supply chain; secondly by investing into tinting machines (as APIL can respond to demand immediately) and finally, by expanding the dealer base to enhance penetration at the same level of inventory. Today, Asian Paints has, at its fingertips, information about every dealer including patterns of offtakes, orders, payment and growth. “This helps us in responding to specific schemes and helps us improve the sales of the specific SKUs we target,” opines Malekar.

FORECASTING AND PLANNING

While embarking on the process of planning and forecasting, the following points had to be considered:

1. **Peak to Average:** Paint, even though sold throughout the year, sales at the dealer level increase tremendously during Diwali and to a certain extent during other festivals. Now if sales happen near Diwali then the most crucial month for the dealer to lift inventory is August or September (depending on when Diwali falls). So increased production for the build-up has to begin in July and also in August. Forecasting has to be done for around 300–400 fast moving SKUs accurately so that inventory turnover is high and the company is not stuck with dead stocks. Another innovative practice implemented in this context was to split the peak in the months of relatively low sales by using various promotional schemes. This would help balance out facility management and inventory held.
2. **Causals:** While forecasting demand for a specific period, several factors need to be considered such as schemes, causals during that period and then arrive at the variable sale that happened due to these causals. Now again, considering the amount of SKUs it is indeed a complex task for the distribution department to find variable sale and some assessments are made wherever the historical data needs to be backed up.
3. **Large User Business:** Sudden demand requirements from large institutions have to be factored in all of the above. These prominent large institutions do

not give much leadtime and production has to be scheduled for these unexpected huge orders in between these hectic months.

All this makes demand forecasting extremely crucial for optimization of company's resources. Even a small error can create huge amount of inventory, which will be a deterrent for the company.

Forecasting of demand is the starting point for Asian Paints. Historical data is used to update forecasts of demand for a 4-month horizon every fortnight by the demand analyst. The demand planner reduces the forecast error since it holds, within its database, details of past sales, present scenarios as put in by Asian Paints, variances, one-off demand spurts and so on. In effect, it rationalizes the variances between the forecast and the trend and gives a far more realistic picture than was based only on forecasts, which may really be nothing more than pure gut feel. The demand expected is whetted by the field for specific inputs and thrust areas. These estimates are cross checked with the previous year's actuals as a sanity check. The assessment of the General Manager – Sales is then applied on the product mix that has been obtained at a month level. This process normally takes around 10 days.

The demand planner is dynamic and real time. It can change forecasts, situations and promotions strategies and the planner would re-run and get a close estimate of sales, taking into account any changes and the effect of changes on other parameters in business.

Once the demand planner is run, the supply chain planner is run. This package now optimally allocates demand to the plants on the basis of landed costs of materials and the cost of labour. It also deploys the plan at all the field units ensuring rapid replenishment. The level of "drill down" depends on how much detailing the company wants and needs. The supply chain planner has the master plan, the inventory plan (with safety and replenishment parameters) and the distribution plan. In other words, this planner allocates the demand using a "what-if" scenario, working out the best way to allocate production and distribution considering the type, quantity and direction of demand to ensure optimal costs. In this planner, total cost of logistics is central, not just individual components of transport, warehousing, and so on. It also looks at the "postponement" principle, how much a product can be delayed before being put into a final irrevocable form and how close to the customer can the paint be made in distance and time. This package

gives Asian Paints the best possible solution to meet the complexity of cost benefits of manufacturing sites and sales sites.

The next step is to run factory planner. This package allocates the quantities, times and machines to be used at each plant. It is fed with all manufacturing details and in correlation with the supply chain planner (which feeds it the allocation of SKUs and distribution to the market), the factory planner then decides which machine should make how much and when. In essence, it does an “aggregate” plan. This planner ensures optimal asset utilization and constantly considers real-life constraints like material and machine availability, unlike other planning systems, which consider them separately, and end up with a constantly adjusting production plan. The use of this planner has given Asian Paints “clear reduction in raw material and packaging material inventory, better coordination between machines, people and vendors. In Asian Paints, the result of the factory planner is the generation of the daily production schedules, which are as real time as technology can make it,” feels Vikram Jaisinghani, GM—Manufacturing.

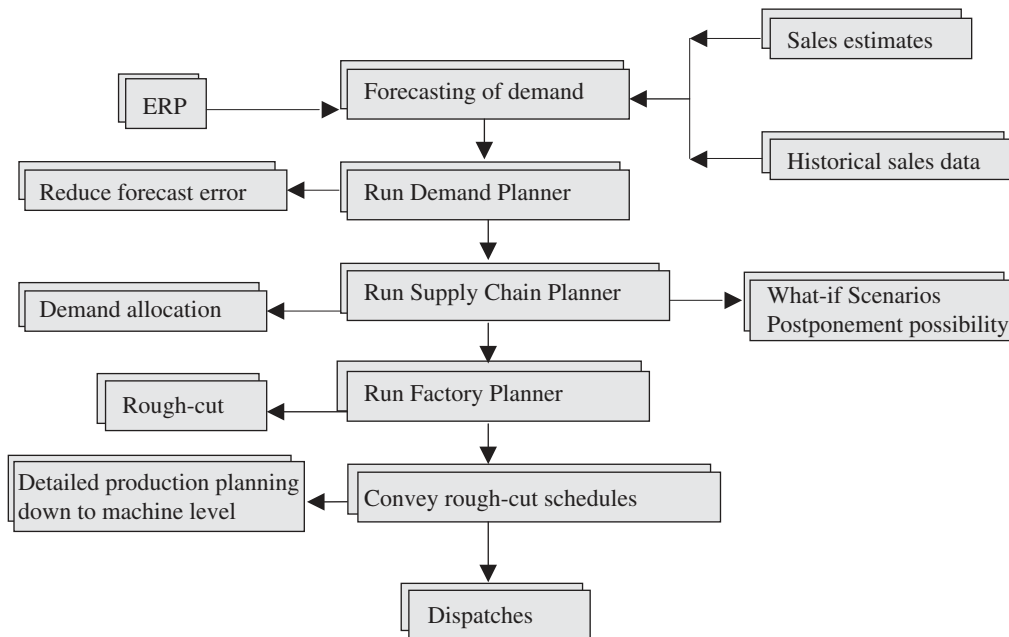


Figure 5.10 Pictorial depiction of Asian Paints Supply Chain

All the above are done at HO and take 5–6 days to complete. Once the rough-cut is ready, it is sent down to the factories which break down the rough-cut into people, shifts, material procurements and so on to give a final production plan. Having done this, Asian Paints is in a position to respond quickly to changes in demand patterns, unforeseen events like for example the Gujarat earthquake or even a sudden export demand.

An immediate advantage was that the company achieved benefits in terms of reduced finished goods inventory and raw material inventory. A look at the company's performance points to sustained reduction in finished goods inventory, which stood at 24 days in 01–02 compared to 34 days in 00–01 and 37 days in 97–98. The value of finished goods stood around 6.7 per cent of net sales in 01–02, compared to 9.6 per cent in 00–01 and 10.2 per cent in 97–98. Clearly, the finished goods inventory has seen a drastic reduction. All this has helped the company improve its working capital. As a result, free cash flow situation is extremely healthy which is evident from the results of the company in 01–02, where the company had released around Rs 176 crores of free cash-flow, which was primarily due to the reduction in working capital requirements. Further, Asian Paints has always been known for its strict credit policy, which is reflected in its management of debtors. Debtors for 01–02 was around 33 days compared to 37 days in 97–98. The industry average of debtors is over 40 days. Net Working capital in 00–01 was 87 days compared to 106 days in 97–98 and 144 days in 91–92. All this proves that the company has come a long way in the management of working capital. Over here, one must be reminded that the number of SKUs that Asian Paints manufactures are the highest compared to any industry. Hence seeing the way the company has managed working capital is commendable.

Freight costs were Rs 41 crores in 2000, up 24 per cent since 1999, but remaining constant at 3.4 per cent of net sales. This shows that while sales have gone up, freight, a major component of supply chain costs, has not gone up in the same proportion. The freight, however, includes some percentage of freight paid for inbound too. It is noteworthy that total inventories have actually fallen to 11.5 per cent of net sales in 01–02 from 16.3 per cent in 00–01, a fall of 4.8 per cent in just a year. From the total inventory in number of days, one can see the significant improvement in the last decade. Total inventory in number of days was 55 days in 01–02, 76 days in 00–01, 99 days in 97–98 and 118 days in 91–92. This exemplifies the improvement in working capital management done by the company.

The following table is a further testimony to the tremendous achievements of APIL.

WC in no. of days											
Inventory cycle	01-02	00-01	99-00	98-99	97-98	96-97	95-96	94-95	93-94	92-93	91-92
Raw material	24.93	29.40	31.72	35.20	45.09	37.60	40.37	57.88	40.94	37.79	63.40
Work in progress	6.01	12.34	11.99	13.55	17.19	15.48	15.58	18.80	11.75	12.77	13.53
Finished goods	24.00	34.45	35.96	34.84	36.61	35.48	37.72	41.78	33.94	34.68	41.39
Debtors	32.54	36.60	29.26	32.17	35.54	32.68	30.61	34.55	30.10	38.05	36.72
Creditors	27.51	25.81	29.87	19.46	28.12	18.08	16.08	22.55	11.40	10.47	11.27
Net working capital	59.96	86.99	79.06	96.30	106.32	103.16	108.19	130.46	105.33	112.81	143.77

PROCUREMENT OF RAW MATERIALS

Like all other companies in the industry, raw materials account for more than 55 per cent of expenses. As mentioned earlier, APIL has a strong base of 18 outside processing units (OPUs) located all over the country. Part of the production is outsourced to these units. Very interestingly, procurement, distribution, etc. is all handled by APIL. These units need to just concentrate on converting the inputs into paint as per the APIL standards. Hence APIL has to handle inbound as well as out-bound logistics for these OPUs as well. Inorganic chemicals, pigments, solvents, etc. are some of the key inputs to Asian Paints manufacturing. For example, titanium dioxide is one of the key ingredients in paints. These commodities can be imported freely and sourcing at Asian Paints considers the import option very seriously.

Also paint contains solvents and monomer, which are petro product derivatives. They are price sensitive and fluctuation can be high depending on the global business environment. Other material like tins and paper bags are procured locally since the vendors find sufficient incentives in terms of volumes from Asian Paints to set up plants near the factories. Raw material inventory as a percentage to net sales has been consistently coming down. It was around 11.6 per cent in 91-92 and was 7.6 per cent in 97-98. In the financial year, 01-02, it was at its lowest at 3.9 per cent of net sales.

The company has started using the e-procurement tools for negotiating with the suppliers, viz. reverse auctions etc. They have also been used for negotiating with

RM Control	(Rs crore)										
	01-02	00-01	99-00	98-99	97-98	96-97	95-96	94-95	93-94	92-93	91-92
Net sales	1,316	1,197	1,066	895	802	737	705	512	402	373	339
RM inventory	51.9	56.8	55.8	53.7	61.1	47.9	52.0	52.4	30.3	25.2	39.5
% RM inventory to sales	3.9	4.7	5.2	6.0	7.6	6.5	7.4	10.2	7.5	6.7	11.6

transport contractors and needless to say the savings were substantial. The company does its own distribution and has no plan to engage a 3PL in the near future.

MANUFACTURING—ENVIRONMENTALLY FRIENDLY POLICIES

Manufacturing of paints is done at four plants located at Bhandup, Mumbai which have a capacity of around 20,000 tonnes, Ankleshwar in Gujarat with a capacity of 80,000 tonnes, Patancheru in Andhra Pradesh which has a capacity of 80,000 tonnes and Kasna in Uttar Pradesh with a capacity of 50,000 tonnes. An additional capacity of 36,000 tonnes comes from the outside processing units located all over the country. “All the plants are ISO 9001 certified and have received ISO 14001 certification for environment management standards. All the plants are moving along an integrated manufacturing strategy towards global competitiveness and global standards,” says Jaisinghani.

A multi-locational set-up helps Asian Paint save substantially on transportation costs. And respond quickly to market demands. Paints manufacturing uses a lot of hazardous chemicals and hence generates a lot of effluent and waste as by products. “Treating this effluent for reuse without damaging the environment is the philosophy of Asian Paints,” adds Kini. The plants use incinerators to incinerate, recycle and reuse this waste. The water used for cleaning in the plant is also recycled and reused either for watering the plants or for some use other than human consumption. All practices are governed by sensitivity to the environment. In 2001, the company plants in Ankleshwar and Patancheru got clearances to increase capacity from 50,000 tonnes to 80,000 tonnes each. These clearances were given to both plants, by proving to the authorities that their plants would

increase capacity by reducing effluent, i.e. these plants would generate less effluent per tonne produced on the increased capacity of 80,000 tonnes than the effluent it generated when these plants produced 50,000 tonnes. The company's proactive policy in environment management was recently recognized in June 2002 when its plant at Patancheru received two of the highest awards in environment management. The plant was conferred 'The Golden Peacock Award' instituted by the World Environment Foundation and presented by His Holiness, The Dalai Lama. The award for excellence in environment management given by the Andhra Pradesh government and presented by the then Chief Minister, Mr N. Chandrababu Naidu. All of this definitely puts APIL in a different league altogether. Last but not the least, APIL has won the runners up Golden Peacock Award for Quality Management for the year 2002–03 in the large manufacturing category !

TAPPING OTHER HIGH GROWTH AREAS

The industrial coatings segment in India is essentially dominated by automotive paints. In order to capitalize on the high growth opportunity in autos, APIL has set up a 50:50 joint venture with PPG industries (USA).

Another high growth opportunity in the domestic paints market is the powder coatings segment. In FY02, APIL acquired Hawcoplast Chemicals Ltd. which enjoys a strong position in the powder coatings market with established product brands. The company was acquired by APIL's 100 per cent subsidiary, Asian Paints Industrial Coatings Limited (APICL). The powder coatings segment is the fastest growing segment in the industrial coatings market registering growth of around 12 per cent in the last financial year. The trend noticed is that other segments like Can, Coil & OLP (Other liquid paints) are gradually switching to powder coatings. This trend and available new opportunities ensure a bright future for powder coatings.

ASIAN PAINTS—TRULY GLOBAL

Through the 1990s, APIL had ventured into Overseas markets and established a significant presence in 11 countries across Asia, Australia and the Middle East.

However, all the Overseas ventures put together accounted for less than 5 per cent of the company's consolidated turnover in FY02.

APIL has recently taken a big leap in the international arena by acquiring controlling stake in SCIB Chemical, Egypt and the Singapore-based Berger International Limited. Currently Asian Paints operates in 23 countries across the world. It has 27 paint manufacturing facilities across these countries with combined paint manufacturing capacity of 330 million tonnes per annum.

SUPPLY CHAIN AND ACQUISITIONS

"The important aspect of these acquisitions is that they were funded through internal accruals by the strong free cash flows of the company which was a result of the working capital saved on account of best SCM practices adopted by the company," states Kini proudly. In fact, the entire top management is thrilled about this, and why not? Over the last couple of years since SCM initiatives were put in place the company could expand in all directions. There was money to fund these expansion plans, enhance control and visibility into operations and most importantly spur management and staff to move ahead.

"In the future we plan to consolidate our position further and take steps that would make us one among the top five decorative companies in the world," says Kini. Agrees Malekar, who said: "In the next couple of years the focus will be on extending the supply chain by bringing in some dealers as part of our CRM initiatives and extending it at the other side to include some of the key suppliers as well, as part of our SRM initiatives."

(With inputs from S. S. Kini, Soren Malekar, Vikram Jaisinghani and Jason, website, research reports and newspaper articles.)

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Retail Supply Chain

Retail supply chain in general and in India in particular is a very intriguing area constantly baffling the fast moving consumer goods (FMCG) companies and keeping them on their toes. According to an estimate, India has 12 million retail outlets but only 2 per cent of the market is organized. According to management guru C K Prahalad, some of the paradoxes of the FMCG growth in India are one billion people yet low penetration, low usage yet growing affluence. In order to resolve the paradox of the FMCG, Prahalad suggested a need for better price performance equation, better understanding of the consumer decision logic, investments in education in collaboration with NGOs, government departments and focus on new categories. The key is in creating products and formats which are oriented towards understanding consumers and not our conveniences.

This poses a tremendous challenge to the manufacturers. The dynamism of the consumer market has most impacted the retail supply chain. This is evident from the fact that after a boom time in the late '90s, 2000 was a tapering year with growth rates further dwindling. The slow pace continued to rage the Rs 800 billion FMCG industry. Growth continued to elude most categories. Soaps, detergents, oral care, skin care, beverages, milk products, babyfood witnessed flat or negative growth rates. The exceptions were a few categories such as edible oils, branded staples, bakery products, chocolates, mosquito repellents, shampoo, hair dyes and sanitary napkins, which registered positive growth rates. Here too, growth rates were nowhere in the 20+ range witnessed in the late '90s. Growth in most categories has tapered down to more somber levels of 5–15 per cent.

The year 2001 saw most of the companies go into restructuring mode to boost bottomlines in the absence of topline growth. FMCG heavyweight HLL pruned its brand portfolio to concentrate on 30 power brands, hived off unrelated businesses and merged subsidiaries where there were synergies with existing businesses. Food companies like Cadbury, Nestle and Britannia managed to improve profitability aided by soft commodity raw material prices. P&G focused on improvements in supply chain efficiencies and passed on the benefits to the consumer in the form of reduced prices. Tata Tea worked on improving productivity at its plantations. Marico reduced its adspend. Profit growth of most companies was therefore more satisfactory.

The decade was one of cost cutting, change and restructuring and hence SCM. But in order to ensure growth it has become mandatory for retail supply chains to be adaptive and anticipative. Adaptive supply chains or supply networks are those that are flexible enough to meet the demands of the changing consumer markets. Another major challenge faced by FMCG companies is the multi-channel marketing that has evolved over the years. Retail supply chain needs to cater to all of these various channels while at the same time maintaining single-point contact with the customer. This needs greater collaboration and visibility between all points within the supply chain and all its extensions.

Success or failure of retail supply chains is judged by one single parameter: “Stock-out”. Stock-outs are supply chain failures and the situation is aggravated by the fact that it is difficult to calculate stock-outs or lost sales and even more difficult to calibrate lost customer goodwill. This has made “stock-outs” of strategic importance and no more an operational issue. Stock-outs are fallout of planning, forecasting, and understanding of demand and market situation and can result in improper brand positioning and loss of customers to competitors.

Key Issues in Retail Supply Chain

- Capturing exact customer information
- Types of retailers—urban vs. rural, big vs. small, organized vs. unorganized
- Small shelf life—distribution nightmare

- Quick emergence of “me too” products
- Services more important than products—Retailer being the buying arm of the consumer rather than selling arm of the manufacturer (free home delivery etc.)
- Changing consumer—changing preferences, habits, priorities
- Fragmented market, reaching the product on time to retailer and ultimately to consumer
- Product mix
- Multichannel marketing
- Mass customization
- Deverticalization

CAPTURING EXACT CUSTOMER INFORMATION

This is a major challenge for the FMCG sector as the whole sector is volume intensive. Getting customer information, viz. what are they buying, in what quantity, which age group is buying what, when and so many other related questions and answers thereof cannot only help the manufacturers plan for manufacturing and inventory but can also help them in taking marketing decisions such as advertising and promotions, etc. Currently companies rely on the retailer's version of the “sale”. Several decisions are taken based on his perception of the situation. Of course several companies have town sales officers who make shop-to-shop calls and record their views on sales, promotion schemes, direct customer feedback, etc. However, this can never be complete and authentic. To top it, the economy in general and retail sector in particular is going through a downturn and retailers are finding it increasingly difficult to stay afloat in these economically troubled times. IT and its tools that allow the retailers to understand its customers well can to a large extent help companies tackle the blues. And there are examples and cases where getting exact customer feedback has made a lot of difference. For example, Toys R Us increased inventory turns 100 per cent in 18 months (2.5 to 5); decreased out-of-stock

inventory 80 per cent, improved customer service by 70 per cent and reduced cashier turnover by 30 per cent after they introduced technology to capture the exact customer information. Connecting the distributor or retailer with the company's data warehouse as has been done by Marico is one of the methods of transmitting information from the distributor to the company in real time. Getting information on each and every minute of sale as it happens is the most difficult task. Bar coding or bar codes are technologies that are capable of providing last-minute details on sales.

BAR CODE

Combined with data-collection technology, bar codes provide a rapid, accurate and efficient means to collect, process, transmit, record and manage data in a variety of industries. Retail, package delivery, warehousing and distribution, manufacturing, health care and point-of-service applications can all benefit from the use of bar codes.

A bar code can be described as an “optical Morse code.” A series of black bars and white space of varying widths are printed on labels to uniquely identify items (Figure 6.1). The bar code labels are read with a scanner, which measures reflected light and interprets the code into numbers and letters that are passed on to a computer.

Automatic Identification: Automatic identification or “Auto ID” encompasses the automatic recognition, decoding, processing, transmission and recording of data, most commonly through the printing and reading of information encoded in bar codes. Bar codes allow for rapid, simple and accurate reading and



Figure 6.1 A bar code

transmission of data for items that need to be tracked or managed. Bar codes can be printed directly on mailing tubes, envelopes, boxes, cans, bottles, packages, books, files and other paperwork, furniture, cards and many other items for identification.

The emergence of auto ID systems, including bar codes and the related printers, scanners, decoders and software, has significantly increased the speed, efficiency and accuracy of data collection and entry. Early application of bar code scanning, which included retail point-of-sale, item tracking and inventory control, have been expanded to include more advanced application such as time and attendance, work-in-process, quality control, sorting, order entry, document tracking, shipping and receiving and controlling access to secure areas. These expanded systems have measurably increased productivity by linking production, warehousing, distribution, sales and service to management information systems on a batch or real time basis. Consequently, opportunities to improve operational efficiencies and customer responsiveness have developed for retailers, transportation and package delivery companies, manufacturers, wholesale distributors and service providers.

Benefits of Bar Coding: Bar code data-collection systems provide enormous benefits for just about any business. With a bar code data-collection solution, capturing data is faster and more accurate, costs are lower, mistakes are minimized and managing inventory is much easier. The following are some of the benefits of bar code data entry.

Fast and Reliable Data Collection: A bar code scanner typically can record data five to seven times as fast as a skilled typist, with 10,000 times better accuracy. Keyboard data entry creates on an average one error in 300 keystrokes. Bar code data entry has an error rate of about 1 in 3 million.

Reduced Costs: This is the most obvious benefit of bar code data-collection. In many cases, this cost saving pays for the entire data-collection system. Do not put all of your attention on this benefit, however. Even though this is the most apparent benefit, it is often overshadowed by even greater savings from other areas.

Reduced Revenue Losses: This benefit often surpasses the savings in labour costs. You know that if you make a significant error on an invoice in the customer's

favour, you will never hear about it again. However, if the error is in your favour, you will hear about it immediately. In most companies, it does not take many errors to amount to a great deal of lost revenue.

Necessary Inventory Levels: Using bar codes is one of the best ways to reduce inventory levels and save on capital costs. Keeping a tight handle on inventory can save significant amounts of money.

Improved Management: Although hard to measure, this is an important benefit. In many cases, improved management due to automated data-collection technology could be the best benefit of a bar code system. A bar code system can easily gather information that would be difficult or impossible to gather in other ways. This allows managers to make fully informed decisions that can affect the direction of a department or company.

Faster Access to Information: This benefit goes hand in hand with better decision making. With better information, you can gain opportunities and get the jump on the competition.

Examples: The following are just a few of the many ways bar codes are being used to improve the profitability and efficiency of a variety of company types:

Point of Sale: Point-of-sale is one of the most common segments of the bar code market. Use of bar codes in department stores has gained widespread popularity. Benefits of bar coding in point-of-sale systems include:

Cost Savings: This is the most obvious benefit. A medium-to-large store can save enough checking time to significantly reduce payroll. You also save direct labour costs through less time spent taking inventories and ordering products.

Customer Satisfaction: A proper bar code system will speed customer checkout. This will improve customer satisfaction enough to directly increase revenue over time.

Reduced Inventory Costs: Immediate access to inventory information on a real time basis can be used to reduce inventory levels. This will reduce costs for a company in a number of ways, including interest, labour for handling excess inventory and facility overhead.

Automated Reordering: Accurate stock levels allow for automated replenishment of low inventory.

Better Decision Making: With bar code data-collection you can tell not only what the customers are buying, but also when they are buying it and in what combinations. This can improve business management by suggesting better locations for goods in the store and identifying advertising targets.

Point-of-sale systems can be used in any retail setting. There are abundant opportunities for PC-based systems in small to large-sized businesses, such as video stores, convenience markets and clothing stores.

Work In Progress: Many manufacturing and other industries have work that must go through several steps to completion. Bar code systems can track material through each step of the work and keep detailed records on each piece or batch. When a problem occurs in the output, supervisors and managers can track the work back and quickly resolve the issue. This is one of the best ways to improve both quality and yield in virtually any multistep process.

Inventory Control: Tracking inventory manually is a laborious process. With bar codes applied to each item in inventory, portable scanners can be used to track shipping and receiving and quickly take physical inventory. The data from portable scanners can be uploaded to a central computer system at regular intervals or portables can update inventory in real time, depending on the system you choose. Bar code inventory control provides accurate, real time inventory updates. This allows a company the opportunity to reduce stock levels and thereby reduce carrying costs. It also reduces the time taken to collect data for purposes such as annual inventories. With improved efficiency, operating costs are lower.

Secured Access: A secured access system provides door and gate security by controlling access using encoded employee identification badges. Bar code badge scanners or magnetic stripe readers are mounted at doors and gate entrances and authorization is provided from a central computer.

Time and Attendance: A time and attendance system uses encoded employee identification badges that are scanned when employees start and stop work. This allows automatic tracking for payroll and eliminates paper time sheets and time clocks.

Quality Control: Bar code systems in quality control can be used to tell a person which test to perform for a given part and where to send it, if it fails. Bar code systems can also create permanent records for tracking component and subassembly failures.

Packaging: For packaging, a bar code printer is used to generate a label to identify part numbers, serial numbers and shipping information. This labelling can be used to automatically sort packages for shipment, automate receiving and greatly enhance package tracking.

Collection of Data from Forms: Businesses such as medical and dental practices rely on complex patient forms. Using bar codes, detailed information can be quickly entered in the computer. Bar codes printed by check boxes on a form allow fast, accurate data entry by simply scanning the codes by the check boxes. This makes an easy task of gathering large amounts of information for a client. Reduced data collection costs and better service are the results.

Productivity Measurement Systems: Productivity measurement is a practice that can drastically reduce labour costs in manufacturing, warehousing and most other types of business. A well-managed system will allow supervisors to isolate the problems that may come up so that they can take steps to solve them. Within an organization, departments may have different types of activities, making it difficult for supervisors to keep track of what everyone is doing. Productivity-measurement systems automatically track the work being done and compare it to expected output. When the results do not measure up, supervisors can take corrective action. This type of informed supervision and management can typically cut department costs by 15–20 per cent.

Bar code systems require three elements:

Origin: You must have a source of bar codes. These can be preprinted or printed on demand.

Reader: You must have a reader to read the bar codes into the computer. The reader includes an input device to scan the bar code, a decoder to convert the symbology to ASCII text, and a cable to connect the device to your computer.

Computer system: You must have a system to process the bar code input. These can be single-user, multiuser or network systems.

EAN.UCC STANDARDS

EAN.UCC system is a common global language of business and is a set of tools that provides a standard way of identifying, tracking and tracing products, services and locations. It is a key, facilitating national and international communication between various trading partners. The EAN.UCC system is a set of tools enabling efficient management of global, multi-industry supply chains by uniquely identifying products, shipping units, assets, locations and services. It facilitates e-commerce processes including tracking and traceability.

The EAN organizations in over 98 countries world-wide have been responsible for administering the EAN.UCC system through national numbering organizations. Currently over 900,000 companies world-wide across trade and industry segments use the system to provide an universal and unambiguous method of identification of their products, services and locations as they transit through supply-chains across national and international markets. EAN India, an affiliate of EAN International, Belgium, is a not-for-profit organization set up as a Government of India and Indian industry joint initiative to administer and promote the use of the EAN.UCC system of numbering to Indian trade and industry.

EAN.UCC provides a common language for trade and commerce world-wide that is applicable to virtually all industrial and commercial sectors.

EAN.UCC numbers, represented as bar codes, can identify all products for sale, trade or transport and are used to monitor and control the flow of goods from supplier to customer.

The EAN.UCC system is recognized at all points in the supply chain, from the handling of raw materials through to check-out. It can be used in manufacturing, distribution, warehousing and retail enabling the automated collection and validation of data. The EAN.UCC system offers a way to capture and communicate vital management information in a more efficient, more accurate, and timely manner.

Electronic trading systems such as EDI manage the information that flows up and down the supply chain. Integrating these with the EAN system allows business, industry and government to implement electronic commerce solutions that significantly enhance supply chain management at local, national and international levels.

(Courtesy EAN India. Information used with permission.)

Retailer plays a dominant role in an FMCG supply chain and hence it is imperative that the supply chain understand the types of retailers, their compulsions, pressures, exigencies, entry and exit routes and their USP's (Unique selling proposition). Figure 6.2 describes the various types of retailers that operate in India.

The situation is further complicated as there are several ways in which retailers view and implement their supply chains. Following are some of the ways in which retail supply chains are viewed and implemented:

1. Store-led: Some retail businesses delegate considerable responsibility for purchasing to store managers. Overall terms may be set at the centre and budgets for stock and margin provided to the store manager. Beyond this, the responsibility

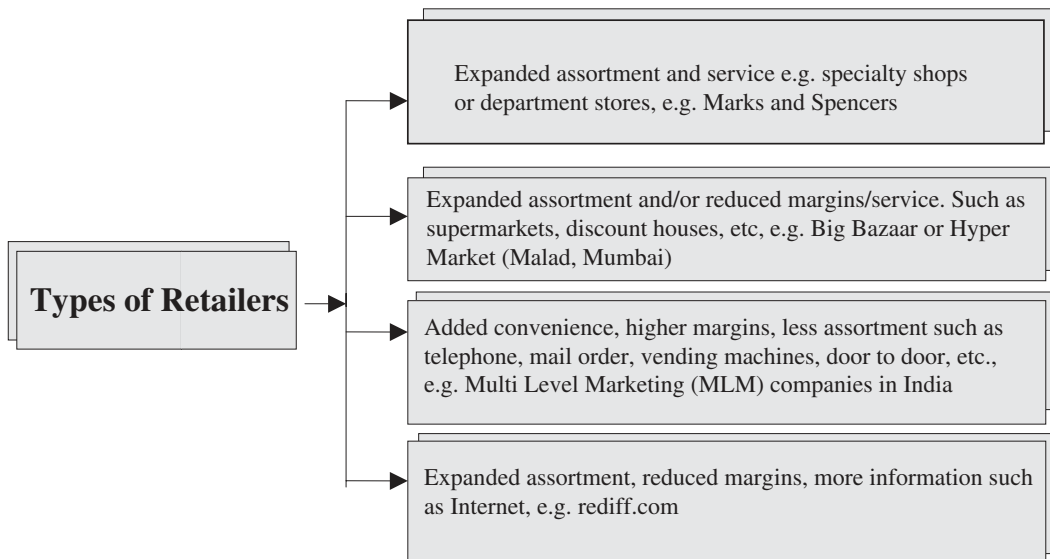


Figure 6.2 Types of retailers

substantially rests with the store manager himself. This approach was common in large chains before the advent of electronic point of sale (EPOS) but is still found in leading edge players in some areas, such as book and record retailing. It is also still common within the department store sector.

A variant on the store-led model appears in sectors in which a considerable responsibility is left to the supplier to manage quantity and detailed range definition, often supported through his own merchandizers. In this case, effectively the responsibility for the performance of the space is handed over entirely to a manufacturer. This approach is often found, where a retailer does not have expertise in a particular department and can exist alongside other types of buying organization. It is common in product groups such as confectionery, women's hosiery cosmetics, crockery and with strong branded manufacturers and penetration into a wide variety of different types of retail outlets. In some sectors, in which the range is complex, the pattern may be fairly widespread throughout a store.

2. *Marketing-led model:* In many retailers, buying is driven primarily by the need to meet perceived needs of the marketplace. In some large retail organizations the process of market research and product testing will predominate, probably tied into a strong programme of retail own brand activity and possibly a degree of in-house product development. In other sectors the emphasis will be on employing a high quality of product selection skill to choose from the ranges provided by suppliers and may involve extensive overseas travel to seek out products and designs suitable for the home market.

Within this model the management of stock level of quantity and stock is a subsidiary activity, reporting into the buying function.

3. *Supply chain-led model:* The third groups of retailers are those in which the merchandising and the logistics functions are at least on an equal footing with the marketing and selection functions. Within these businesses, the management of stock levels and the emphasis on the logistics of product and optimum allocations to branches are paramount. The development of ranges is likely to be incremental, driven more by analysis of past performance than by assessment of new offerings or attempts to address newly perceived market needs. The management of stock quantities and negotiation are driven by those who are responsible for the management of the total supply chain and are more likely to be making trade-offs against stock

level and availability than against product features. These organizations generally believe that they are also placing due weight on product so that innovative product selection and marketing the distinctive point about them is that the responsibility for trade-offs lies with the merchandizing or even the logistics function.

Each of the three types of retail chains has its advantages. The *store-led* model is attractive because it devolves responsibility to those who are on the ground or, where it is supplier led, to those with the deepest expertise in the product category. The *marketing-led* model places a premium on responsiveness to the marketplace and gives responsibility for trade-offs to managers who should balance the impact of the changes on the customer as well as on the supplier.

The *supply chain-led* model allows for a high degree of professionalism and analysis to be applied to the process and ensures that the capabilities of the organization are used to the best effect.

CROSS SELLING

Cross selling is one of the key challenges faced by FMCG companies. With big-sized super stores coming up, where several brands of a particular product are kept together with no formal differentiation between them. Cross promotion and cross selling are bound to happen which are likely to upset sales targets, hence affecting inventory and overall supply chain functioning.

PRODUCT LIFE-CYCLE MANAGEMENT

Product life-cycle management is often considered a prerequisite for businesses looking to profit from their supply chain. Fallout of declining product life is introducing a new product that might take over the declining product and thereby making the company remain uppermost in the consumer's mind. These new products need to reach the market faster to gain a competitive advantage through increased market share and higher profit margins. For this, enterprises must improve new product development process as, speed up response times to customer demands and develop design and launch capabilities that can be operated round the clock. Companies also need to work more closely with their partners and suppliers to reduce costs and increase time to market through collaborative

product life-cycle management. Collaborative forecasting and planning effectively transforms a supply chain from a linear process into an intelligence marketplace. Product life-cycle management tools enhance product and customer-related data management capabilities and allow companies to more easily share information about buying habits, consumer feedback and promotional strategies across the supply chain. Using customer-based information effectively can help reduce cycle times, enhance manufacturing efficiency, encourage the development of more innovative products, and reduce product development costs.

IMPORTANCE OF SERVICES

Free home delivery, telephone and catalogue shopping, on-site warranty, etc. are some of the sops companies and retailers offer to consumers to win them. This trend is likely to increase and might become one of the differentiating factors in years to come. This puts a lot of pressure on the FMCG companies who have to fight the battle on both the fronts—product and service. The concept of service chain which will have to flow parallel to the product supply chain will evolve. This will happen after the companies start including ‘pre-sale’ activity in its definition of service. In most of the companies usually service chain starts after the product is sold as illustrated in Figure 6.3.

MULTICHANNEL MARKETING

The complexities of multichannel marketing can be daunting and can seem to exponentially increase the variables a marketer must manage. The stakes are high, but for many companies, innovatively delivering benefits through integrated multichannel

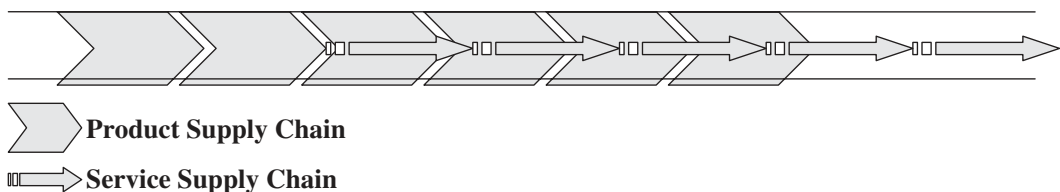


Figure 6.3 Concept of service chain which is longer than the product supply chain and also proceeds from the product supply chain

solutions is the key to significant profit growth. The problems have become intense following the birth and subsequent growth of a dominating consumer. This obviously puts a lot of pressure on the companies as they have to align their supply chains along these various routes. Hence the supply chains of today have become more destination-oriented rather than origin-oriented. The manufacturer used to design his supply chain from the point of production. But now since the onus is on the distribution and catering to the customer along these various routes, the supply chains should be destination- or customer-oriented. Companies must ask themselves the following questions before devising a supply chain plan:

- Where is the customer?
- What are his requirements?
- How do I reach him?

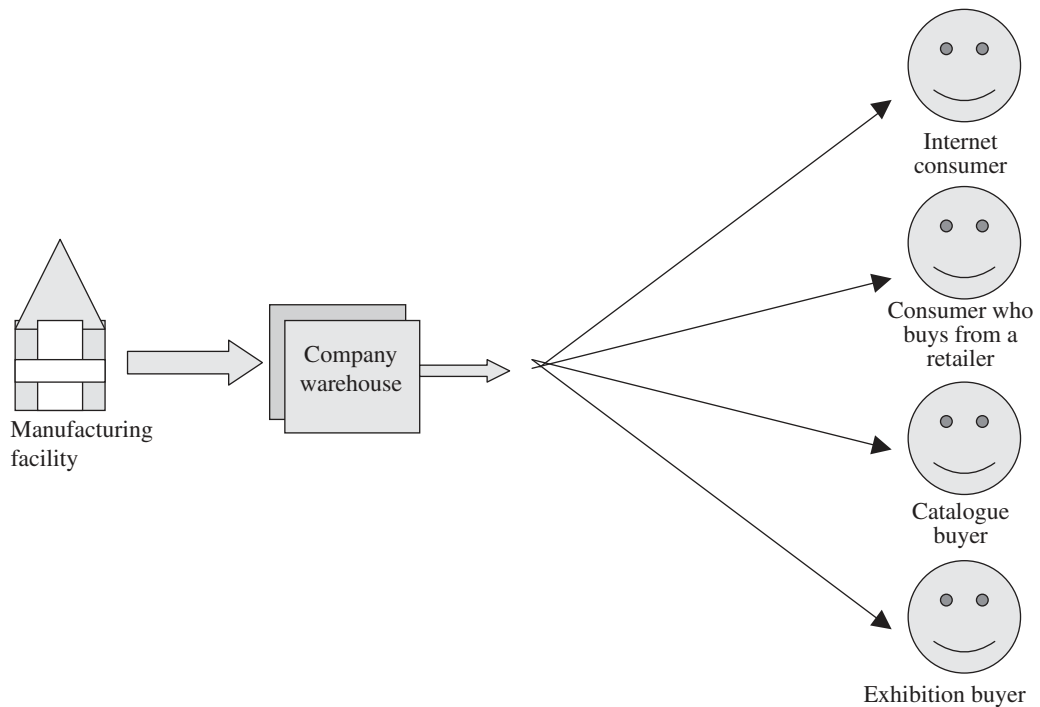


Figure 6.4 Supply chain offshoots to cater to multichannel marketing

- What is his satisfaction level?
- How many channels does he use to communicate his need to me?
- What kind of service should be packaged along with the product?

These supply chain offshoots (Figure 6.4) put a lot of pressure on distribution. Hence it is important that companies take into consideration the effect and subsequent cost of meeting the demands of such multi-channel customers. The trade-off should be between the high distribution costs and the possibility of losing the customer.

MASS CUSTOMIZATION

Mass customization is the customization and personalization of products and services for individual customers at a mass production price. The concept was first conceived by Stan Davis in 'Future Perfect'. It was then further developed by Joseph Pine in his book 'Mass Customization'—*The New Frontier in Business Competition*. Traditionally customization and low cost have been mutually exclusive. Mass production provided low cost but at the expense of uniformity. Customization was the product of designers and craftsmen. Its expense generally made it the preserve of the rich. Today, new interactive technologies, like the Internet, allow customers to interact with a company and specify their unique requirements which are then manufactured by automated systems.

Benefits of Mass Customization

Higher Profits

- By providing tailored products to meet particular needs, you make comparative shopping difficult and shift the focus from price to benefits.
- Whilst it is possible to manufacture at a mass produced price, you have the option to charge a premium whilst still retailing below the price of a custom product. This, in turn, will open your product to a wider market.

Lower Costs

- Mass customization allows the ordinary man or woman in the street to acquire a product that has been produced to meet their own particular needs yet at a competitive price, thus providing exceptional value for money.

Market Exploitation

- Personalized and customized products and services will differentiate against commodity-type products. With their similar cost they will be doubly attractive.
- Lead customers will provide a rich source of new ideas that can also be exploited with other customers or with new prospects. As a result, NPD has lower risk of failure and a higher chance of beating the competition.
- Ongoing service can be adapted throughout the customer's life because it can be linked to the unique product.
- Companies will forge close relationships with their suppliers, distributors and customers as they return time and time again for further unique products.
- Satisfied and loyal customers provide excellent references and referrals.

Mass customization puts an additional pressure on the entire supply chain. The solution lies in collaboration with business partners. Sharing information in real time is the key. While BTO may depend largely on supply chain collaboration, mass customization often requires so-called fourth-party logistics-service providers to add the final touch to assembly, as late as possible in the cycle. In the case of Dell, those stocks are dispersed through the pipeline. Dell itself holds around five days, while third-party logistics providers storing supplier-owned products add as much as 10 extra days' supplies, with replenishment cycles to both these resources taking anything from 12 hours to two days.

Dell does not know what will be ordered each day so it has to design a flexible operation that can move production up or down as need be. BTO involves

balancing what is available with what the customers want and Dell has become expert in gently massaging both these factors. Any shortage in a particular component is immediately countered by offering other available products on promotion. Dell has 10,000 customers in the US everyday. So that throws up 10,000 opportunities each day to balance supply and demand.

By monitoring component stock availability in real time, Dell and its suppliers can quickly see problems with any particular part. A first step is to increase lead time, informing new customers that their preferred configuration will take eight to 10 days to deliver rather than the usual five.

An important aspect of Dell's data sharing with its suppliers is the integrity of the information. Dell uses Agile Anywhere software to integrate the various data feeds from suppliers and ensure that website, production and warehouses are all speaking the same language and tracking the same components regardless of the hundreds of technical changes that take place in specifications each week.

DEVERTICALIZATION

Deverticalization involves outsourcing supply chain activities to a third party. Operations assets and activities (procurement, manufacturing, primary distribution and process R&D) can be outsourced thereby creating a company that is asset light and can thus concentrate on supplying and satisfying the consumer.

From the perspective of the FMCG company, deverticalization allows the management team to focus entirely on customer and consumer management—the main engines of growth—while sharing in progressive operations cost improvements through either an equity stake or 'open book' supply contracts. Last but not least, the FMCG company would also achieve a quantum leap in return on capital employed.

CONCLUDING REMARKS

A few remarks from Santa Claus and His Elves, by Mauri Kunnas, a Finnish author, illustrates how the Scandinavians have led the client-centred approach,

certainly in services marketing, for more than a decade:

- **Santa Claus doesn't forget anybody.** (A good point to remember in services marketing). "The smallest package is delivered to the right address, whether it happens to be on land or at sea." (Wise words about delivery mechanisms). "How does he do it? 'A lot of work and a little magic' is all Santa will say."
- **Santa asks his customers to tell him what they want, and not necessarily what they expect.** He then gets those items to his customers to satisfy their wants and makes sure that the right item goes to the right customer. Zero defects, in other words.
- **Santa makes no mistakes.** Santa never has any problems with returns or defects or (except, perhaps for a lump of coal in someone's stocking) someone not receiving exactly what was wanted.
- **Santa uses a combination of hard work and 'a little magic'.** If the researcher in the just-mentioned paper is right, the power of tapping into customers' wants rather than their expectations is potentially great. In fact, it is the source of the 'little magic'.

CASE STUDY

Marico Supply Chain

FMCG SECTOR

FMCG as it is more fondly known as has always been an extremely intriguing sector. In India this sector is estimated at Rs 400 billion and comprises segments like personal care, soaps and detergents, skin care, oral care, health and hygiene products, agro products and branded food. Driven by consumers, the common man and volume it has always posed serious challenges to the manufacturers. It will not be wrong to call the '90s as the decade of FMCG. The early '90s following liberalization of Indian industry witnessed a high double digit growth. However, the last 3–4 years have witnessed a slack in growth bringing it down to single digit. Extensive advertising, innovative promotion schemes, attractive product discounts, etc. that are used to lure the consumer directly eat into the manufacturers' bottom-lines. And with thriving competition from the branded and organized market as well as from the unbranded and unorganized market, the onus is now on the supply chain and how cost effectively it performs. Most of the products in this category are low-cost, thus allowing consumers to be impulsive in their buying decisions. Product availability all the time becomes the key to impulsive buying. This further makes an efficient supply chain the epicentre of manufacturer's strategy.

MARICO INDUSTRIES LIMITED (MIL)

Marico was incorporated in 1988 and began commercial operations in 1990 when it acquired the consumer products division of Bombay Oil Industries. The last 13 years have seen MIL emerge as one of the most respected FMCG companies of

India. With sales of Rs 6.96 billion (approximately \$ 142 million) for the fiscal year ending March 2002, with six factories, 125 SKUs and about 1000 employees, MIL has maintained steady revenue and profitability growth throughout the past 10 years. Marico offers a range of products to the local and export markets (primarily South Asia and the Middle East), including refined edible oils, food products such as jams and sauces, niche fabric care products and hair oils. Specifically, MIL operates in two broad segments—nature care (coconut oil, value-added hair oils, anti-lice treatment, fabric care) and health care (refined edible oils, low sodium salt, processed foods). From a two brand company in 1990 to a nine brand company now, out of which three of its brands are market leaders, MIL has come a long way.

CASE STUDY

This case study covers the story of Marico and what makes item tick. In an FMCG company, marketing of products is the key. A lot of investment goes into sustaining and growing existing products and introducing new products. And the supply chain initiative should be in tune with the marketing initiative. If this does not happen, advertising and promotion money can go waste due to nonavailability of product on shelf. Recognizing this, Marico has continually invested in strengthening its distribution for staying ahead of competition. This case study provides an insight into the operations of Marico—the methods they have adopted, the tools they use and the IT capabilities they have acquired to win in the end-user market.

SUPPLY CHAIN INITIATIVE

The need to look at the entire supply chain and optimize it in totality was governed by several factors. MIL experienced a large scale expansion and growth during 1990s thus facing challenges to sustained and continuous profitability. Expansion brings with it several operation level challenges. These are problems faced by any company in its growth years. Simultaneously the landscape in terms of IT was changing, providing an opportunity to leverage the emerging “trends in software and IT”. Marico was also well positioned in terms of its unique work culture to enable the change management so critical to embracing these new

technologies. MIL decided to focus on consumer facing business processes such as distribution and its own internal operations that would target inventory, stock-outs, etc. The main goals of this supply chain initiative were improving forecast accuracy to match supply with demand, delivery performance to avoid stock-outs thereby creating a dependable and reliable brand image without excessive ad-spend.

MIL SUPPLY CHAIN (DEMAND CHAIN)

Given its scale of operations, MIL has a very complex supply chain. As mentioned earlier, the supply chain of an FMCG company is distribution intensive and inbound logistics is not a big problem, Marico as well as this case study covers only the outbound aspect of the distribution. This is the reason why the details on number of suppliers and the supplier side echelons are not included in this study and in Figure 6.5.

IMPLEMENTATION PROCESS

Background

In 1999, the company embarked upon a detailed evaluation of its existing processes to determine the best way of proceeding on its journey and to understand its

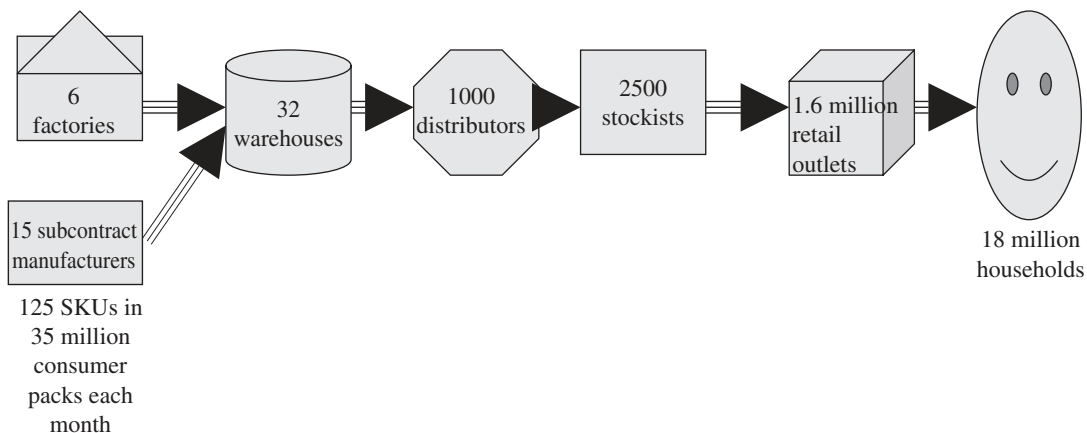


Figure 6.5 Supply chain offshoots to cater to multichannel marketing

weaknesses and problem areas. The findings were that with millions of SKU distribution point combinations, distribution was the major constraint. Internal operations had to be aligned to meet the distribution level challenges. Comparatively, manufacturing was straightforward and was not required to be focused upon. Similarly, Marico procured only a few commodity raw materials (such as vegetable oils, safflower seeds, copra) and hence handling this side of the supply chain was not a big issue.

END USER—THE PATHBREAKING CONSUMER TOUCH

Marico supply chain starts with the question “What does the customer want?” And even beyond that “What is the potential to provide answers and solutions to problems that even the customer does not realize exist?” The goals, strategies and overall operations in Marico revolve around these questions. Introducing innovative products or innovative packaging are all the results of these questions and the subsequent desire to find their answers. Whether it is the history of Parachute, pioneering the switch from tin cans to plastic bottles, or Revive creating a market where none existed before to more user friendly product packaging, strong R&D team that includes scientists from diverse fields, product and packaging innovation teams comprise oil technologists, microbiologists, nutritionists, pharmacists, statisticians, process engineers, packaging designers and technologists, cosmetologists and analytical chemists make it possible. Marico has excelled in making life simple for the consumer. Some other examples of innovation that are nothing short of technical breakthroughs are: Saffola Kardi–Corn Blend, positioned on the platform of preventive heart care is probably one of the first edible oil blends in the country. This oil blend provides the benefits of two oils, thereby giving added value to the consumer. Saffola Salt is a salt with less sodium and higher potassium and calcium content than ordinary salt. This, plus Saffola glue-free consumer friendly jar and cost-effective packaging technology for blow moulding and decoration makes the product desirable.

Everything revolves around thinking out of the box and constantly innovating. Over and above creating and introducing innovative products that add value to the customer, it is important to measure the performance of the existing brands, get a firsthand feedback from the consumer and thus understand his perception of the brand. Marico Action Plan (MAP) is the answer. MAP is a “Road Map” to

the consumers' heart and mind. It enables the company to manage all the key processes involved in building brands. MAP also helps Marico identify marketing tools (product, pack, etc.) to change the way the target prospect would think/feel or do regarding Marico Brand. Then there is a Goodwill index that computes the brands performance by three parameters, viz. salience, endearment and price premium. In short, the customer, the end user is the epicentre of Marico's universe.

STREAMLINING THE INTERNAL OPERATIONS

The biggest driver of internal operations is planning and forecasting. What to make? When to make? Where to make? What to line up for distribution? Where to send? etc. are all questions that need an accurate answer to overcome the menace of inventory. Marico had a planning cycle of 30 days and during this period was unable to respond to changes in demand. The bucketed time horizons for manufacturing and distribution were not synchronized and distribution levels were uneven. Forecast accuracy was abysmal. Also, spreadsheet-based planning method and nonintegrated transaction systems inhibited widespread visibility to essential data, further compounding planning process.

The first step in streamlining was to automate the whole process wherein data is picked up (and not fed) from various sources, integrated and converted into required information. This also streamlines the planning and forecasting process thereby removing demand and supply mismatches. Marico wanted to address the internal collaborative forecasting between manufacturing sites and distribution, i.e. warehouses. After many deliberations, Marico implemented mySAP SCM to enable the planning and execution processes. These processes included calculation of monthly shipment requirements from its plants to its warehouses to support make-to-stock operations, electronic transfer of stock level data from the distributors to Marico and push distribution of products from Marico to distributors based on forecasted retail level demand and distributor inventory levels.

Implementation of SAP R/3 capabilities in finance, cost accounting, materials management, production planning, quality management, and sales and distribution was started in June 2000 and went live quickly in a 'big bang' implementation in April 2001. Commenting on the 'big bang' method of implementation as against the phased approach, Vinod Kamat, General Manager, Materials said that

“Implementing SCM and related software is like a Do or Die hence Big Bang approach is more appropriate.” Further, he said that “It makes sense to complete the implementation process while the morale and enthusiasm are still high.” Implementation of the demand planning and supply network planning capabilities of the SAP advanced planning and optimizer (APO) of mySAP SCM along with the SAP business information warehouse (SAP BW) began in August 2000 and went live once again in a ‘Big Bang’ implementation in May 2001. 26 staff members and 20 consultants assisted in the project, using AcceleratedSAP (ASAP) methodologies to ensure rapid implementation. The scope included all company factories, warehouses and business offices, distributors, and contract manufacturers. The implementation achieved systems integration that efficiently supported the new planning and execution processes.

The implementation produced quick results. By early 2002, forecast accuracy was improved by 14 per cent, and the levels of shipment activity through each third of the month had become more even. The planning cycle time was reduced from 30 days to 15–20 days, and enhanced reporting facilitated management decision making. These results led to reduced internal and distributor inventory, fewer stock-outs, lower levels of lost sales, and reduced supply chain exception handling costs.

Implementation brought with it several challenges. Sudden availability of information is one of the biggest challenges faced. One day prior to implementation there is a blackbox like situation that is riddled with assumptions and the next day when the system goes live there is suddenly an information overload. In the ‘black box’ days there were information providers who supplied the required information. This information was, however, not timely or completely accurate and hence urgency of the situation was lost by the time it reached the decision maker. And as Kamat puts it “whatever is not timely does not get acted upon.” The fallout was obviously lost sales and ultimately lost customer goodwill. The new system automatically picked up information from the various sources and made it available ‘On Time’ to be able to act upon and salvage the situation if it so demanded. In the blackbox days, there used to be an ‘estimated situation’ which was a function of the data one could gather while now it is a ‘true situation’ based on all possible type of data. While moving suddenly to ‘information situation’ there is an absence of benchmarks to compare performance. And if the manager compares the current

true situation with the estimated situation of the past, his only reaction is that of disbelief. The difference is so perplexing. However, benchmarks evolve as the journey progresses.

One of the salient features of Marico's supply chain is availability of similar type of information to both top and bottom rung of the company. Usually, the top management is more concerned about strategic issues and seeks information that can help them strategize, while the middle and lower rung employees are concerned with operational information. This kind of segregation creates layers and thus fails to unify the objectives. At Marico both strategic and operational information is available to everybody in the organization. This helps in unifying the objectives thereby creating a common goal for everybody irrespective of position and decision-making powers. Marico culture breeds empowerment thereby bringing out the best in everybody.

METRICS

Another major challenge was identification of metrics. "What gets measured gets done." And "metrics drive behaviour" feels Kamath and hence he lays tremendous emphasis on metrics rather the correct metrics. The art and science of measurement is flush with different types of metrics such as simple metric vs. weighted metric, strategic metric vs. operational metric. "So it becomes important to select the one that can measure our kind of system efficiently and reflect the true picture of our performance," opined Kamat. For example, if a gross sale is to be evaluated both simple as well as weighted average can be used. But a gross sale is not as simple as it sounds as it will not be appropriate to consider only gross sales ignoring the SKUs. This will present only a part of the picture. Unfortunately, there is no 'one size fits all' metric. Another issue is to identify the number of metrics required to assess the company's true performance. One can have as many metrics as required to reflect the correct picture. For example, in the case of Marico, some of the examples are product launch vs. distribution targets, active outlets vs. lapsed outlets, lines per day (retail SKU combination), metrics to calculate the sales force productivity, etc. Finally, it is vital to understand the focus of the chosen metrics. That is, there are pure metrics that are often straightforward such as in this case the number of depot SKU combinations to assess the stockout and there is a derived metric such as lost sales or estimated lost sales (an estimate

can always go wrong) that can be challenged. Then we can have a leading indicator or a lagging indicator. For example “How much is your distribution?” is a leading indicator as against “Whether sales has happened” is a lagging indicator. Thus metrics is one of the most important areas and needs a lot of brainstorming and detailed discussion. To a large extent it should reflect the goal of the supply chain. At Marico all the chosen metrics are online and computed using the database. The manager can use his discretion and pivot the database to compute the metric. This business data warehouse is well integrated with SAP R/3 on one side and MiNet on the other side and hence all the necessary data needed to extract the required information is readily available. Hence at Marico, metrics are action oriented. This allows a manager to exert greater control over operations of the company. This is truly a best practice. Some of the excellent standard metrics available are Score and Oliver White. Talking about comparing various companies with each other, Kamath pointed out that it is more appropriate to benchmark processes rather than metrics.

PLANNING AND ESTIMATION

Marico has a practice of having an annual plan which is used to create a 3-monthly rolling estimate. In typical FMCG parlance, a sale is deemed a primary sale when the manufacturer sells the goods to its direct customer, the distributor. The sale becomes secondary sale when the distributor in turn sells it to a retailer. When the retailer sells it to the end consumer, the sale is called offtake. In an ideal scenario, in order to accurately forecast demand and hence plan various manufacturing and supply chain-related activities, an FMCG organization should be able to obtain consumer offtake data in a timely and reliable manner. However, given the scale of operations (e.g. MILs products are sold through some 1.6 million retail outlets), it is virtually impossible to capture the offtake data for supply chain decisions, which have a much shorter time frame (higher frequency). Hence most FMCG organizations make their forecasting based on primary or secondary sales data. It is difficult, virtually impossible to capture data related to the exact number of items sold by the retailer and the number of items on his shelf. With the implementation of R/3, MIDAS and MINET, Marico is well connected to obtain information on secondary sales and distributor stocks. However, Marico through its Internet-enabled network that links all the distributors and major retailers with its ERP, is able to get a lot of correct detailed information on primary data in some

cases and secondary data in other cases. This data is used to compute the future course of action. The issue here is estimate or target? Points out Vinod Kamath. A consensus plan allows one to estimate based on granularity. Demand planning helps create targets for production, for supply, etc. Advanced Planning Optimizer (APO) which is a part of the SCM package from SAP forecasts the demand using casuals, univariate multiple regression, etc. Demand forecast is then used to plan for demand (production planning, etc.) and supply network planning (distribution, etc.). Since APO's implementation, Marico has had a fairly accurate demand and supply situation. Consensus planning is based on granularity and past data system. This is required to strategize for the immediate and long term future. The results thus achieved were dramatic. Marico shortened its planning cycle from 30 days to about 15 days; revised its demand planning process to forecast 'sales out' (shipment from distributor to retailer); and implemented an improved process to replenish its distributors. The company focused on achieving relatively even shipment levels throughout each month and developed internal collaborative processes to support planning. This approach was enabled by mySAP supply chain management software, which includes demand planning and supply network planning capabilities coupled with SAP R/3 and SAP business information warehouse.

The results achieved are exemplary. Stock-outs associated with distributor sales to retailers decreased by 33 per cent. Total revenue improved by 1.5 per cent as lost sales due to stock-outs reduced by 28 per cent. Excess distributor inventory was reduced by 33 per cent. Late deliveries to distributors got reduced by 37.5 per cent. Reduced costs associated with supply chain exceptions by a whopping 25 per cent (for example, intracompany stock transfers, truck detention costs, etc.). Plus some other nontangible benefits such as making the company more agile and more responsive.

CUSTOMER-FOCUSED OPERATIONS

The scale of distribution of Marico is very large and very complex. As mentioned earlier and in Figure 6.4, every month, over 35 million consumer packs (approximately 125 SKUs) from MIL reach approximately 18 million households through 1.6 million retail outlets serviced by the distribution network. This puts a lot of pressure on the distribution network. The vital driver of efficient

distribution is connectivity between the various points on the route to retailer. Proper connectivity will allow smooth passage of information and hence proper and timely distribution.

PROJECT MI-NET (MARICO INDUSTRIES NETWORK)

MI-Net (Marico Industries Network) was conceptualized as an Internet-enabled application that would “establish a network between MIL and its distributors through a web interface.” The prime motivation behind the project was to obtain the secondary sales data at the distributors’ end in a timely and accurate fashion, so as to render it actionable.

Traditionally, MIL had relied on town monitoring reports (TMRs) for collecting secondary sales data. The data was gathered by the territory sales officers (TSOs) of MIL, who would periodically visit the distributors in their territory and write down data on opening and closing stock levels for various SKUs, performance of sales schemes, etc. Depending upon the category of market (large/small) this data would be collected over a 7-day or a 10-day period. Each TSO would then collate the data for all the distributors in his territory and send it to his area sales manager (ASM). Each ASM would then collate the data from the six TSOs reporting to him, and send it to the regional sales manager (RSM). Finally, each RSM would collate the data for five ASMs in his region and send it to the corporate headquarters. Even though the report was passed on to the next higher level by fax/e-mail, typically the consolidated data for a particular cycle would reach the forecasting personnel only by the middle of the next cycle. Moreover, since the data was collected manually by the TSOs, its accuracy was also questionable. Also communicating with the TSOs was difficult as they were constantly on the field. Many a time the TSO would get to know about the new products or schemes from a retailer or a distributor. Hence, MIL started exploring options on increasing both the timeliness as well as the accuracy of secondary sales data. Thus was born MI-NET or Marico Industries Network. Simply put, the idea was to connect everybody with everybody else. However connectivity can only proceed automation and not the other way round.

The first step in implementing MI-NET was conceptualization and implementation of MIDAS (Marico Industries Distribution and Automation Software). The

idea was to provide the distributors with software that would capture information related to various bills and invoices, dispatches, receipts, etc. Instead of making entries in a ledger book/billing book, the entries would be made directly into the computer. The next stage was to connect these computers to the main computer at Marico.

The whole process started with initiating everybody, including distributors, retailers, etc. into the project. Implementation could be done either by having a push strategy whereby making it compulsory for the distributors to implement the software or a pull strategy whereby taking the distributors in confidence and making them realize the benefits. Best practice is the pull strategy which was used by Marico. MIL embarked on a mass scale mission of communicating the potential benefits to its distributors. This was done at two levels, viz. the TSO who was anyway interacting with them heavily would convince them by addressing their issues. And on the second level the MD himself sent out letters to all distributors explaining the concept and the potential benefits. The tone of the letter was that of a partner talking to another and managed to convey the top management's involvement in the project. This worked beautifully barring some teething troubles which were successfully handled. By March 2001, MIL had covered all its class 'A' distributors (turnover greater than Rs 6 million per year) in the urban areas. The rural rollout started in November 2001, and was over by February 2002. In all, 330 class 'A' distributors, accounting for almost 75 per cent of MIL's primary sales are currently using MIDAS. The rest have not been covered, as MIL's low business volume with them makes it financially unviable. This solved part of the problem as the data that was now available was more accurate. But still the TSO had to go to each distributor and collect the data floppies. This did not solve the second and most important purpose, i.e. timeliness of information. It still took time for the data to reach the decision makers. Hence the time was now ripe for integrating the various distributors across the country with the company's warehouse.

MIL envisaged an Internet-based system where the distributors could log in and supply the necessary data. With the availability of MIDAS, it was possible to build an application that would reside on the distributors' PCs and would automatically transfer the data from MIDAS to MIL's central server every time the distributor logged in. MIL decided to build a website that would be linked backwards to the ERP server. An application program would automatically download the data from the ERP system into the MIDAS package in the distributor's PC, and also

upload the data from the package to the ERP. The information from MI-Net would not only provide a TSO with more current information at lesser effort, but would also free up a lot of time that was earlier spent in data collection and collation for preparing reports.

The third important goal of MI-NET was to bring TSO into the mainstream by integrating and connecting him directly to MIL. Over and above automating and integrating, the distributors MI-NET also created a virtual office for the TSO. Earlier, the TSO would visit the area office once in four to five days to get all necessary information. But now a TSO could log in anytime and get connected to MIL. He was able to access data related to his territory. In addition, he would be able to make applications (loan applications, etc.) on the site, check out new commercials for various products, check out corporate bulletin board, etc. In order to build a community feeling, the site would also have community-related features like chat, daily announcements of birthdays and anniversaries, contests, and so on. This not only benefited him professionally but at an emotional and psychological level as he started feeling a part, of the wide Marico family. In short, TSO now has a way of 'being in the office' all the time.

The fact that both MIDAS and MI-NET are extremely user friendly and easy-to-use made it easy for the company to implement and users to use.

According to Pradeep Mansukhani, CEO (Sales), the system can allow distributors to use the same software for products of other companies and at the same time ensure confidentiality.

The usage of the system is being monitored in terms of frequency of usage by each distributor (daily, once in two days, etc.). MIL believes it is too early to start measuring benefits, but expects immediate benefits in terms of reduction in distributor transaction processing costs and costs on communication related to inventory and order status. Commenting on the potential benefits, Mansukhani said, "We can track sales of our brands and receive feedback on new products launched. It also improves control on credit and sales, online order and fulfilment tracking and obtain competitive feedback on schemes and their effectiveness."

This makes Marico probably one of the first FMCG majors in India to achieve the last mile connectivity to achieve supply chain effectiveness.

FUTURE PLANS

The next connectivity level is the retailer. Getting the information on the consumer from the retailer is extremely vital in FMCG as the business is volume intensive. Giving some of the large retailers an access to MIDAS is the next step, says Mansukhani. Palmtops are being currently tested to give the retailer level connectivity. This will ensure a smooth inflow of offtake data which will provide not only a better transparency but wiser decision making.

As mentioned earlier, the TSOs role has been redefined following MI-NET and has become more value added. One of the immediate plans is to send out SMS alerts to the TSOs on the 10th of every month as a reminder of the various activities they need to undertake.

CONCLUDING REMARKS

13 years into operations and one of the brand leaders in the hugely competitive FMCG market, Marico has come a long way. Success in FMCG sector is governed by availability of the brands to the consumer at the right time and place. In the process a lot of data gets generated and hence timely collection of the data is the key and can become a differentiating factor. This case study illustrates how Marico has used IT to tame the FMCG tiger.

(With inputs from Pradeep Mansukhani and Vinod Kamath of Marico.)

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Vendor Partnerships

Two or three companies working together can obtain more benefits than a single company operating selfishly in its own interest.

— *Anonymous.*

Vendor relationships have come a long way. From bitter, acrimonious and antagonistic to mutual, trustworthy and long term, the journey from one side of the spectrum to the other side has been a long and tedious one. Changing customer preferences and market conditions are said to be the vital drivers of these altering buyer–supplier relationships. End-user market pressures resulting in shrinking profits on one side and a demanding and vociferous customer on the other forced the companies to look inwards and generate profits internally. There were two ways of doing this: one was a short-term solution that the manufacturers were doing anyway—extracting from the supplier, negotiating hard and toughs thereby antagonizing the supplier and the second was a long-term solution which involved establishing good relationships with the suppliers who would supply at good rates without compromising on quality. Needless to say, companies chose the latter option which was not only long-term but also led to the development of partnership and related concepts.

The troubled '70s were characterized by mistrust and mutual exploitation. It was the age of the manufacturer where he was the king and dictated everything. And

since he could dictate the customers into buying whatever he was making, he did not require his suppliers. He did not trust them and tried to extract as much from him as possible. The relationship could be described as 'Beyond the sight' in which the relationship with the supplier compelled the manufacturer to keep him out of his sight. The decade of the '80s up to '90 was one that believed in legal and contractual relationship. The manufacturer believed in tying the supplier legally. The relationship could be more appropriately described as 'Beyond the arm' or arm's length. The manufacturer did not allow the supplier to come anywhere near him. Hard and tough negotiations were the order of the day.

The early '90s saw the opening up of the Indian economy, as a result of which multinational companies came in with superior product and quality technology. They also brought with them superior processes and philosophies. Indian companies realized that the finished product could be of good quality only if the raw material was of sound quality. The quality revolution made customers aware of the products they were buying and liberalization gave them such options. This made companies look at suppliers as business partners. From the mid-'90s till date, we see a relationship based on partnership. 'Let's work together to achieve prosperity' is the mantra today. The relationship can be aptly called as the 'arm' relationship where the supplier is one arm of the manufacturing while the distributor or wholesaler is the other arm. And together, they fight in the customer's market for a slice of the market.

The coming decade is set to bring the buyer and supplier still closer and the relationship will be more mature and symbiotic. The mantra will be 'Let's improve the value chain.' The supplier has progressed further and become the 'mind' of the buyer wherein they indulge in codesigning and cocreativity. The supplier today has become one of the key resources and is usually involved at the conceptualization stage itself. Table 7.1 looks at the changing role of trading partners.

Thus, in a world of converging consumer tastes, rapidly spreading technology, escalating fixed costs and growing protectionism, more collaborative relationships with suppliers are critical instruments for serving customers in a global environment. Many manufacturers now recognize that their ability to become world-class competitors is based, to a great degree, on their ability to establish high levels of trust and cooperation with their suppliers (Figure 7.2). With higher standards of performance being demanded in each business environment, companies are looking to their suppliers to help them achieve a stronger competitive position.

	Traditional		Forward looking
Supplier base	Large for safety—even if one vendor fails, nothing will be lost	Rationalized for leverage and quality	Optimized—right source for right part
Sourcing	Transaction driven—as and when need arises	Sole source by part	Strategy driven—overall need of the organization
Contracting	Short-term	Multi-year contract	Long-term business relationship
Relationship structure	Limited structure—little interaction	Single ‘blueprint’ all suppliers irrespective of importance are in similar relationship	Multiple forms—type of relationship dependent upon needs of two businesses
Supplier interface	By purchasing	Through purchasing	Multifunctional (parallel)
Design process	Sequential (design/source)	Iterative (design/source/redesign)	Simultaneous design
Supply chain	Decoupled, not related to requirement	JIT delivery—pull system	Synchronous suppliers are aware of buyer’s needs
Quality control	Incoming inspection	Supplier certification and inspection	Integrated
Service offering	Product only	Higher value-added product	Value-added services
Planning	Short-term schedules	Long-term requirements planning	Drive process and product technology investments
Business objectives	Minimize price	Minimize total acquisition cost	Minimize customer value

Table 7.1 Changing role of trading partners

SUPPLIER COLLABORATION

There are several areas where the supplier and buyer can collaborate with each other to win customer confidence. Table 7.2 gives an exhaustive list of all possible areas for buyer—supplier collaboration.

Research suggests that the companies with the most successful SCM practices across an array of industries focus on creating and maintaining partnerships with the most qualified vendors.

	Collaboration criteria	Typical collaboration issues
1	Quality measures	ISO 9000, continuous improvement programmes, zero defects.
2	Costs	Open book costing, total cost of ownership, active elimination of waste.
3	Logistics	Continuous improvement in logistics, geographic location, JIT philosophy.
4	Management skills and compatibility	TQM adoption, top management compatibility, good corporate planning.
5	Design capability	Responsible for component and sub-system design and detailed specification, supplier involvement in product development, supplier engineers to customers firm.
6	Lead times	Reduced set-up and cycle times, cellular manufacturing.
7	Investment record and plans	Good financial history, continuous investment.
8	Communications	EDI, good communication between 1st tier and 2nd tier suppliers, multiple communication channels.
9	Problem solving capability	Flexible response in problem solving, adequate expertise to solve.
10	Workforce skills and training	Secondment of employees to customer plant, implement training plan to deliver total quality, training of employees harmonized with technology.
11	Packaging	Continuous improvement in packaging, perform environmental impact study of packaging.
12	Capacity	Capacity to meet demands from all sources, capable of forecasting capacity requirements.
13	Supplier's culture	TQM management culture, team work and cooperation, strategic fit culture of both firms.
14	Environmental awareness	ISO 14000, environmental assessment studies.

Table 7.2 Buyer–supplier collaboration areas

A study was conducted among 150 companies within 31 industries that have demonstrated strong SCM practices. Following are some recommendations arising out of the survey:

- Companies should align their SCM systems with strategic initiative and goals. For example, some successful companies have formed partnerships

with their suppliers and now work together to realize mutual gains and reach strategic goals.

- Select suppliers based on criteria stretching beyond traditional cost per unit considerations. The goal of these partnerships is to be able to combine talents and resources across the supply chain, leading to gains in cost reductions, quality, flexibility, customer responsiveness and overall performance.
- Certify supplier partners to establish a common language for communication. Research adds that successful companies often certify their partners at different levels.
- It's important to constantly refine and improve the manufacturing processes. Partners should always identify which organization in the supply chain can perform a specific task at the highest quality and the lowest cost.
- Use technology to improve supplier partnerships. Rather than limiting to only one or two ways of working with the vendor, use a wide array of communication tools.

Companies that implemented these practices have noted benefits including zero paperwork processing errors, 50 per cent reduction in lead times, 50 per cent reduction in inventory and 99 per cent on time delivery.

(Source: Reproduced with permission from Benchmarkingreports.com.)

SUPPLIER MANAGEMENT

Supplier management has thus emerged as one of the key areas for companies the world over. Supplier management encompasses everything from choosing a supplier to nurturing him to getting the best out of him and all the while measuring his performance.

The evolution of supplier management can be traced to the following four stages:

1. Traditional supplier management
2. Leading supplier management

3. Emerging supplier management
4. World-class supplier management

All the four categories are still in existence and companies are making attempts to move into the world-class category.

TRADITIONAL SUPPLIER MANAGEMENT

The most basic and rudimentary type of relationship structure, traditional supplier management unfortunately is still practised in companies. Some of the features of this traditional type are:

- Large fragmented supplier base with few specific relationships. Manufacturer's interest is primary and he dictates the relationship.
- Suppliers viewed as interchangeable and hence have frugal relationships.
- No formal evaluation method. Evaluation mostly by the purchasing department and mostly manual.
- Communication by exception and only when absolutely necessary.
- Incoming inspection a routine and a necessity.
- Rejections an order of the day.

EMERGING SUPPLIER MANAGEMENT

The next stage in supplier relationship management, emerging type of relationship is typified by a much stronger relationship structure. Some of the salient features are:

- Preferred suppliers with limited relationship structure.
- Supplier rating system that is not exhaustive but quite detailed.

- Bi-directional communication but mostly related to procurement decisions. Does not yet extend to include codesigning or value engineering exercise.
- Key suppliers provide product certification.
- Site visits, surveys, supplier review and other tools that can bring the buyer closer to the supplier.
- Limited supplier consolidation.

LEADING SUPPLIER MANAGEMENT

An advanced supplier management type, leading supplier management has a more well defined structure and format. This is the beginning of a relationship based on mutual trust and understanding. Built-in evaluation and performance metrics that are more designed to improve the relationships become the order of the day. Some of the features are:

- Formal supplier certification.
- Service level agreements with performance metrics. The relationship here goes beyond the product and includes the service component that surrounds the product.
- Formal evaluation which is based on scientific principles and where all the departments are involved. A transparent system which provides an input not only to the supplier but also to the buying company.
- Understanding of supplier cost drivers and incentives. This helps companies decide a price that is encouraging for everybody.

WORLD CLASS SUPPLIER MANAGEMENT

This is the ultimate stage in supplier management where the supplier is a business partner and together both the companies aim to fight the competitor in the end-user market. The relationship is mutually dependent and based on sound and

healthy communication. Some of the salient features are:

- Supplier self-certification wherein supplier evaluates himself and is more concerned with becoming the best and most valuable partner rather than make only money.
- Key supplier account management where the buying company considers the supplier as the key supplier and together they indulge in growth and development initiatives.
- Strategic relationships based more on long-term strategy rather than short-term gains.
- Inter-firm supply networks which are characterized by inter-departmental coordination rather than by inter-firm coordination.
- Systematic performance ratings/feedback which is based on a scientific and systematic system that is aimed at improving the overall productivity and health of the relationship.
- Two-way communication done via several media such as web, phone, fax, etc.
- Defined supplier rationalization.

Currently, different companies are in different stages of supplier management. But ultimately all companies should aim to be world class.

SUPPLIER MANAGEMENT PROCESS

Supplier management process consists of the following three steps:

- Supplier relationship management
- Supplier development
- Supplier performance management

SUPPLIER RELATIONSHIP MANAGEMENT

Supplier relationship management (SRM) is a comprehensive approach to managing an enterprise's interactions with the organizations that supply the goods and services it uses. The goal of SRM is to streamline and make more effective the processes between an enterprise and its suppliers. Its practices create a common frame of reference to enable effective communication between an enterprise and suppliers who may use quite different business practices and terminology.

SUPPLIER DEVELOPMENT

Supplier development encompasses the necessary steps that the buying company needs to take to ensconce the supplier in his fold. These may include initiatives on supplier upgradation which is a very broad concept and would include the following:

- Technological upgradation that includes initiatives on learning, understanding and implementing improvements in the area of manufacturing technology, raw material upgradation, value engineering, etc.
- Emotional and psychological upliftment aimed at making the supplier secure and helping him tackle the day-to-day problems encountered in the business.
- Technical and managerial support to help him take care of exigencies that can disturb his schedule or working.
- Any other kind of help that will directly/indirectly affect the product being supplied to the company.

KEY SUPPLIER ACCOUNT MANAGEMENT

The Key Account Management (KAM) concept is about developing and building long-term relationships between business partners, resulting in a win-win situation for both parties.

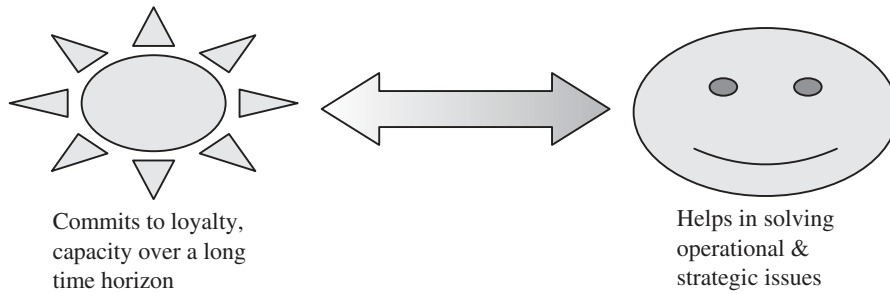


Figure 7.1 Illustrates the concept of KSAM

The buying company has a team called the KSAM team whose work completely focuses on supplier relationship and management. Figure 7.1 illustrates the concept of KSAM.

Some of the features of KSAM are:

- Single sourcing, i.e. the supplier is the sole source of the product and is completely responsible for it. There is no back-up and the supplier has to anticipate and prepare the course of action in case of an eventuality.
- Self-inspection that results in material directly delivered to the shop floor.
- Supplier upgradation initiatives that are done together with the aim of making the whole chain cost-effective.
- Participation in supplier's business with the aim of providing support to the supplier.
- Codesign and comakership wherein the supplier is involved at the conceptualization stage itself and together raw material is defined.

Based on the nature of relationship with the supplier, KSAM can be further classified as:

- Pre-KSAM
- Early KSAM

- Mid-KSAM
- Partnership KSAM
- Strategic KSAM

Pre-KSAM: Traditional supplier management processes wherein companies have a large supplier base and not-so-great relationship with them.

Early KSAM

- Transactions are established.
- Suppliers still a small proportion of customers' needs.
- Supplier still needs to prove himself.
- Interactions still on the single-point level.

Mid KSAM

- Preferred supplier status by catering to more than 50 per cent of the company's needs.
- Despite considerable trust, alternate sources of supply.
- Interactions much closer than 'single point'.

Partnership KSAM

- Strategic source for buying company.
- Sharing of sensitive information.
- Strategic and operational collaboration.
- Long-term partnership agreements.

- Multipoint interaction.
- Pricing with a long-term perspective.

Strategic KAM

- Ultimate stage in relationship model.
- Quasi-integration wherein supplier and customer act together in the process of value creation.
- Deeper interactions and joint teams across functions.
- Information and data sharing.
- Strong exit barriers.

Checklist for implementing KSAM

— *Top management support*

Top management has to appreciate the vital role that the supplier can play in making a cost-effective product. Supplier's core competency lies in the raw material he supplies and hence this decision better be left to him. KSAM helps the companies to reach the trust level where such delegation becomes possible. Top management, however, needs to be convinced about this importance of suppliers.

— *Product that is critical to the very survival of the company*

Motivation to implement KSAM comes from the fact that there is at least one product in the company's portfolio that is critical and its survival depends heavily on the product and nothing should ever go wrong. In this situation implementing KSAM becomes a necessity.

— *Product that witnesses upheavals*

Supplier support in situations where the product suffers from price and volume variations owing to either international fluctuations or some other political or

economic reasons becomes essential. Once again implementing KSAM becomes the need of the hour.

— *Long-term perspective*

Companies with a long-term vision and long-term perspective would always be willing to implement KSAM as they would appreciate the vital role it can play in giving these companies a competitive edge.

— *Willing and cooperative suppliers*

This can be the major stumbling block as some suppliers have a very cautious approach towards such gestures of the manufacturers. Suppliers need to understand that this is long term and in their interest.

IMPLEMENTING KAM

The Process

— *Identify key and critical products (80:20 rule)*

Ideal situation would be to have all KSAM systems for all the purchases, but to begin with, it is better to concentrate on the critical products that form the bulk purchasing.

— *Evaluate the current suppliers of these products—their positioning, track record (if available), their top management, strategy or for that matter the top management itself.*

Suppliers' cooperation in implementing KSAM is essential and hence the company should closely evaluate management team of the supplier, their attitudes, organizational culture and overall their reasons to participate in a KSAM programme.

— *Appoint a KA team (comprising a KA manager and team members)*

Company should then appoint a KA team that will focus on the task of building relationships and implementing the philosophy of KSAM. The team profile has been mentioned below and size of the team depends upon the number of accounts

(suppliers), supplier base, criticality of the product, time frame within which KSAM has to be implemented, etc.

— *Account intelligence*

It is essential to have a complete understanding of the supplier, i.e. the space he is operating in, his drivers of profit and loss, his competition, his USP vis-à-vis other players operating in that space, his other customers and his level of understanding with them etc. This will allow the KA team to know him better and thereby identify areas of cooperation and mutual interest.

— *Create smooth communication channels (web-based)*

The backbone of KSAM is good and smooth communication. Hence establishing channels that can ensure unobstructed communication is a prerequisite.

— *Identify key areas of cooperation and support*

This involves charting out a roadmap for implementing KSAM. The areas of cooperation, mutual interests, defining roles, time frame for implementing, etc.

— *Set goals and objectives for each account*

This is essential to help the KA team to remain focused—measure and monitor their performance, etc.

— *Growth strategy for each account*

— *Service delivery strategy development*

— *Synergy effects*

— *Methods for documenting KAM results*

This is often a neglected activity but an extremely essential one. The KA team has to decide the format for documenting such an activity. The problems and challenges, the achievements and results, everything in the journey towards KSAM needs to be well documented.

TEAM PROFILE

- Sound technical background
- Ability to intermingle with varied cultures
- Good communication skills
- Good analytical skills
- Synergy-oriented attitude

SUPPLIER PERFORMANCE MEASUREMENT

Supplier performance measurement is the process of measuring, analyzing, and managing supplier performance for the purposes of reducing costs, mitigating risk and driving continuous improvements in value and operations.

Common and consistent measurements can help companies focus resources, identify performance glitches, develop strategies for supply chain improvements and determine the total cost of ownership (TCO) of supply relationships, products and entire supply chains.

Implementing a robust supplier performance system is essential to understand the effectiveness of the supplier management systems. How has the company been able to manage the suppliers? Do the suppliers perform as per the standards laid down by the company, and so on? These are some of the essential ingredients of any supplier performance measurement system.

Effective supplier performance system starts with deciding whom to measure? Given below are some of the parameters that can help companies decide upon whom to measure?

1. *Portion of total spend* (this indicates the importance of the supplier and the product he supplies to the company).
2. *Type and nature of product* (easily available product vs. a not so easily available product).

3. *Nature of supplier relationship* (how is the supplier entwined with the company or is it a loose relationship that needs to be subjected to strict audit).

Supplier Performance Measurement Criteria:

The following are some of the commonly used criteria for measuring suppliers. Different companies have different criteria depending on the type of relationship they share with the suppliers. Companies should brainstorm and decide on which criteria are important to them and accordingly give the weightage.

1. Quality (in some cases only, otherwise it has become a non issue).
2. Ontime delivery (important criterion as this has direct repercussions on inventory).
3. Service (important as the service element has become an important criterion).
4. Price (comparative price).
5. Total cost (this indicates the total cost of relationship).
6. Contract compliance (this is an extremely important criterion and needs to be given a high weightage).
7. Responsiveness (this indicates the speed and agility of the supplier to respond to any new initiatives or service requirement of the company).
8. Accuracy of quotes/promises.
9. Technical support.
10. Price variance.
11. Technical capabilities (this includes both IT as well as other technical and technological support that the supplier can offer and with what systems he must respond to developments on this front).

Uses for Supplier Performance Data

Collection of data is important but how the data is used is more important. Given below are some of the uses of this data. Some companies perform all the activities mentioned below while some others believe only in some of them.

1. Share internally (to create intelligence on the supplier).
2. Find supplier improvement opportunities (to decide upon the supplier programme).
3. Evaluate supplier for future business (this is essential as these inputs can help companies decide on involving supplier in future activities).
4. Share with suppliers (this is also essential as the suppliers need to know where and how they stand and the areas for improvement).
5. Predict future performance of supplier (this is done to chart out a long-term strategy for relationship with the supplier).

Time Frame for Supplier Performance Evaluation

When and how often to evaluate the supplier are some of the key questions that need to be answered. The trend is to have a quarterly or specific contract related evaluation followed by an annual general overall evaluation.

Existing Performance Measures

Some of the globally popular measures are

1. Balanced score cards, and
2. Supply chain operation reference (SCOR) method.

Balanced Scorecards

- Provide clearer vision of the strategy.

- Provide feedback around both internal systems and external outcomes.
- Continuously improve strategic performance and results.
- Transform strategic planning from an academic exercise into the nerve centre of an enterprise.

The balanced scorecard suggests that an organization should be viewed from four perspectives:

1. Financial
2. Customer
3. Internal business processes
4. Learning and growth

Financial objectives generally represent clear long-range targets for profit-seeking organizations, operating in a purely commercial environment.

Customer scorecards perspective captures the ability of an organization to provide quality goods and services, the effectiveness of their delivery and overall customer service and satisfaction.

Internal business process perspective focuses on the internal business results that lead to financial success and satisfied customers.

Learning and growth perspective looks at the ability of employees, the quality of information systems and the effects of organizational alignment in supporting accomplishment of organizational goals.

SCOR METHOD

The supply chain operations reference (SCOR) model, developed by the supply chain council (SCC), was compiled to help managers measure the process performance of their value chains and create efficiencies to ensure competitive advantages.

The SCOR model compiles all business processes, performance measurement and best practices associated with all phases of satisfying customer demand.

The SCOR model is organized along five business process types:

- Plan
- Source
- Deliver
- Make
- Return

SCOR spans all customer interactions (order entry through paid invoice), all physical material transactions (supplier's supplier to customer's customer, including equipment, supplies, spare parts, bulk product and software) and all market interactions (from the understanding of aggregate demand to the fulfilment of each order).

The Best Method

There can never be a one size that fits all measure, since different organizations have different priorities and different problems. Hence it is important to define metrics from different perspectives in order to create one's own system that is mutually exclusive and exhaustive.

CONCLUSION

The supplier has become a business partner and a major contributor to the company's bottomline. Both the supplier and the company have to understand and appreciate this. Key supplier account management is the trend which many companies will embrace in the future.

CASE STUDY

Supplier Relationship Management at M&M Automotive Sector

Two or three companies working together can obtain more benefits than a single company operating selfishly in its own interest.

— *Anonymous.*

M&M

Mahindra & Mahindra or M&M as it is more fondly called is one of the largest private sector companies in India employing around 12,000 people. Its two main sectors are—automotive sector (AS) and farm equipment sector (FES) and together the group is about Rs. 6195 crore (FY2003) strong.

AUTOMOTIVE SECTOR

M&M's automotive sector was created in 1994 following an organizational restructuring, but its origins go back to 1946. That was when the company entered into collaboration with Willys Overland Corporation (now part of the DaimlerChrysler group) to import and assemble the Willys Jeep for the Indian market. M&M began producing light commercial vehicles (LCVs) in 1965. Ever since its inception, the company has focused on developing its own manufacturing capabilities. As a result of its relentless ambition in this direction, M&M began indigenously producing vehicles within a short span of the collaboration agreement with Willys. Over the years the Mahindra brand in utility vehicles has come to represent ruggedness, durability, reliability, easy maintenance and operational economy. These are the qualities that have endeared the vehicle to individuals as well as institutions such as the Indian Armed Forces. M&M enjoys a market share of more than 50 per cent in this segment.

M&M's automotive sector has four manufacturing plants, three in the state of Maharashtra and one in Andhra Pradesh. In Maharashtra, its plants are in Mumbai, Nashik and Igatpuri, where utility vehicles and engines are manufactured. Light commercial vehicles and three wheelers are made at the sector's facility in Andhra Pradesh. All the four plants are ISO-9002 certified and the sector is working hard to move up the quality chain and obtain the QS-9000 certification. Already Igatpuri, Kandivili and Nagpur (FES) plant have got QS certification. In fact' they also have the distinction of getting ISO-TS 16949 certification which is by far the most coveted.

Besides state-of-the-art manufacturing facilities, the sector's marketing efforts are driven by a dealer network of over 150 dealers supervised by 18 sales offices. After sales service is provided by a network of over 100 authorized service stations across the country, which meet customer needs for servicing and genuine spare parts.

SUPPLY CHAIN MANAGEMENT AT M&M AUTOMOTIVE SECTOR

M&M has built up an extremely robust chain that is capable of tolerating up to 200 per cent of demand variation. This supply chain inspired by the Toyota Production System has been completely designed and implemented in-house. Customer drives the supply chain initiative at AS sector of M&M. "It is important to hear the customer's voice the moment he buys a vehicle," feels Prashant Kharkar, DGM, SCM. Customer's voice should be captured immediately and relayed to the necessary people, who then take the necessary action. All of this process should happen instantaneously. Initiative to implement SCM started three years ago and to make this happen, a cross-functional team was working full time understanding the interruptions, constraints, bottlenecks and finding ways and means of resolving them. Though SCM at AS uses all the tools and philosophies prevalent in the market such as Kanban, value stream mapping, theory of constraints, etc. it is very simple to understand and follow. Following pull system of inventory management where inventory is not pushed from one level to the other but is pulled as per the need and requirement. The mottos such as "*Sell One—Make One*" or "*Consume a part and then Buy it*" are stringently followed, though this meant changing the mindset of the people. "They had to be trained to decide on the basis of actual consumption rather than stock," illustrates Kharkar.

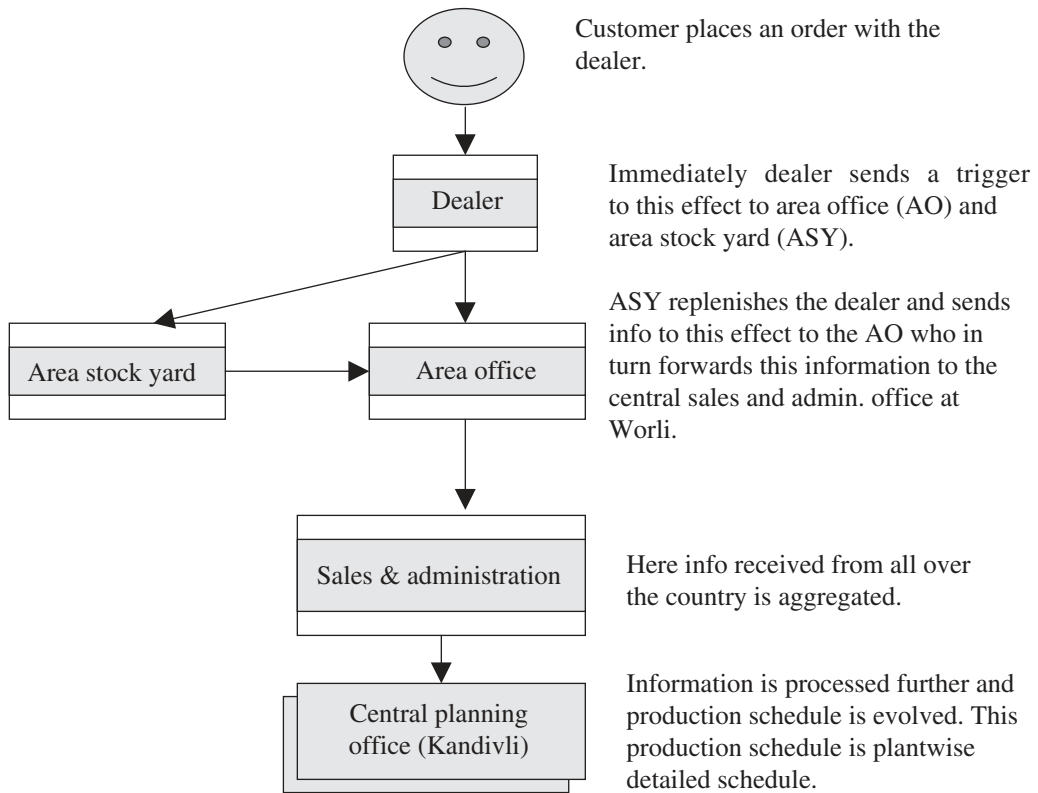


Figure 7.2 SCM at AS M&M

“We concentrated on time, i.e. reduction in time taken for material to move through the supply chain and quality and cost got automatically taken care of,” shares Kharkar. With an ability to deliver the vehicle to the customer in 48 h, AS’s SCM surely has come a long way. Three years ago, the pipeline inventory (plant stock up to dealer stock) at any given point of time was almost three times the estimated sale. After implementing the SCM initiatives, pipeline inventory has dropped down and is now on a par with the actual sale of vehicles per month. And despite such tight control on inventory there has been no instance of any loss of sale till date. This is truly an exemplary achievement given the fact that AS has about 200 various models in their kitty with 30 colour variants.

SUPPLIER RELATIONSHIPS AT M&M AUTOMOTIVE SECTOR

“Supplier relationships or vendor partnerships should be nothing short of a value bond,” feels J.M. Mapgaonkar, Vice President (Vendor Management) Automotive Sector. Vendor partnerships are considered to be extremely important drivers of supply chain at M&M. Any automobile needs around 2000 odd parts, most of which come from suppliers and for want of even one part production schedules can go haywire, confides Vikas Sarangdhar, Manager—Strategic Sourcing. Currently AS is outsourcing 70 per cent of the vehicle parts, but with the trend towards outsourcing increasing it is likely that suppliers will start contributing much more than that. Hence it is extremely important that suppliers are sensitized to this situation. Partnering with suppliers to get the deliveries “on time” “every time” can automatically lead to inventory reduction and hence released working capital. “Our Mantra is *Let us work together towards mutual prosperity*,” adds Mapgaonkar. M&M Automotive Sector under the dynamic leadership of Mapgaonkar has done tremendous work in this area of vendor development and supplier relationship that today suppliers first start working on the order and then bother about pricing, contracts and other rudimentary formalities. This has happened only because the company has been able to build adequate trust in the supplier. The supplier knows that come what may, he will always get justice, says Mapgaonkar. Just like distributor and dealer is one arm of the manufacturer, supplier should be treated like the other arm. And in this sense companies should emulate the human body which treats both the arms as the same, feels Mapgaonkar. Mohan Upadhye, DGM Vendor Development, further adds that their approach is to create relationships and not just sources.

“Relationship building is an important activity and should always start from us while suppliers should only reciprocate,” says Rajiv Jambavdekar, DGM Strategic Sourcing. The usual attitude in the purchasing department is that whenever there is a problem, take care of your company at the cost of everybody else. This is not the correct way of dealing with the situation, one should look after the entire chain and not just one link, feels Mapgaonkar. He adds that the moment one starts doing this, the vendor starts feeling secure and a sense of security is the basis for a long-term relationship. However, the cornerstone of any long-term relationship is to remain competitive at all times. In fact, long-term relationships

help suppliers to be competitive by using economies of scale, by being up-to-date on technology, trends, tools, etc. says Mapgaonkar.

SCORPIO—A CLASSIC CASE

Scorpio is the newest addition to the M&M family. Very aggressively priced, it has already shaken the other giants operating in the area of sports utility vehicle (SUV) automobiles. SUV is the fastest growing market in the world—50 per cent of the US market and 80 per cent of the Indonesian market consists of SUVs. A host of automobile companies have SUVs lined up for the Indian market—Ford is considering the Escape or the Splash, Hyundai is launching the Terracan and Fiat is looking at the Palio Adventure, a cross between an MUV and a station wagon. M&M already has a 50 per cent market share in the domestic market and has a huge export potential. Scorpio, since its launch, has become a rage and has already bagged three prestigious national awards:

- “Car of the Year” award by the Business Standard Motoring.
- “Best Car of the Year Award” from BBC.
- “Car of the Year 2003” award at the CNBC Car Auto Awards.

So what makes Scorpio so special? Indigenously engineered, aggressively priced and a great looking product probably are the keys to its success. Several engineers worked relentlessly for years to design, develop and implement all the plans. Scorpio has all single sources, which is probably one of the major reasons behind it being so competitive, feels Sarangdhar. Suppliers have been involved from the conceptualization stage. Everybody participated in designing the vehicle. “We told them that you give us your commitment and we shall give you business,” confides Mapgaonkar. And that really worked. Vendors feel completely involved and feel that the only way they can contribute is by offering material at low prices without compromising in any way on quality. Scorpio has all single sources and the product directly comes in to the shop floor. No inspection is carried out at M&M. “In fact we saved money as we did not buy any instruments for inspection not even a Vernier calliper,” jokes Mapgaonkar. “In fact, we leverage supplier’s resources for checking,” adds Hemant Sikka, General Manager, Vendor

Development and Upgradation. The supplier made all the crucial decisions such as design & engineering of systems, testing, validation and materials selection, sourcing and engineering locations and absolutely everything else that they would require to decide to make the situation conducive for them to supply at low cost and high quality. All of this was done based on the inputs from M&M. "This is known as blackbox designing, i.e. we just gave them the space in the vehicle and they designed the product according to our specification," Sikka further adds. Giving complete autonomy to the supplier and involving him at the conceptualization stage is the key to both decreased lead time and low cost.

Scorpio has around 2000 parts which are being supplied by around 100 main suppliers and approximately 50 other suppliers. Depending on the product and suppliers location, delivery schedules are drawn. Some items like seats are supplied even four times a day while some other products are delivered up to four times a month. All of these are directly supplied on production line. "This is very unique to Indian industry and this is another feather in the already crowded Scorpio's cap," feels Sikka. Obviously most of the suppliers are JIT suppliers.

Some of the major global supplier's aggregates of Scorpio are:

Interiors (including seats): Lear Corporation that has offices all over the world.

Radiators, instrument clusters and exterior plastic: Visteon Corporation did the engineering of exterior plastic system including front and rear bumpers, all the cladding, the wheel arches, the mudguard, the front grill and any other plastic on the outside of the vehicle, in the US. The final product was sent to India for production.

HVAC: Germany's Behr group did all the engineering, prototyping and validation on the Scorpio's HVAC system in Germany and then moved the system to its facility in India. M&M thus got the dual advantage of getting German engineering at Indian cost.

Diesel engine: Leading engine consultant AVL developed the 2.6 L direct injection diesel engine in Austria with the help of top suppliers like Bosch and Delphi.

After the initial design, the entire thing was moved to India, where Mahindra did the detail design and put the engine into production.

Gas (Petrol) engine: French automaker Renault SA supplies its 2.0 L gas engine.

Brakes: Kalyani Group which has collaboration with Robert Bosch GmbH wherein the brake development was done by Bosch in France with the final system done in India.

Press shop: Japan's Fukul supplied Mahindra's first press shop which has capacity of 60,000 vehicles per year.

Body shop: Korea's Wooshin set up Mahindra's body shop with new fixtures, new welding gun and almost all new transformers.

Dies: Japan's Fuji did the largest and most important panels for Mahindra. Miyazu Selsakusho Co. did the door panels. Also M&M's own die shop was set up in collaboration with Fuji.

End of line testing equipment: Fori Automation supplied the testing equipment.

Starters: Delco Remy Inc.

Electronically controlled transfer case and automatic locking hubs for the 4WD system; viscous fan drive and fan: BorgWarner Inc.

Pistons and aircleaner: Mahle Group.

Seatbelts: Autoliv Inc.

Headlamps: Samlip.

Front axle: Spicer India (Dana Corp).

Mirrors and parking brake: Ficosa International.

The car built at a budget of \$ 120 million is one of the most aggressively and competitively priced SUVs available in the Indian market.

RATIONALE FOR VENDOR PARTNERSHIPS

The paradigm shift in the competition from “between firms” to “between supply chains” has been one of the main drivers for improving vendor relationships. Without suppliers’ cooperation, supply chains cannot start, forget moving. Hence it is vital and important to take suppliers into confidence. M&M always had a culture that encouraged good relations with vendors but a formal initiative to propagate this culture was started in the '90s which was aptly called “strategic sourcing” and since then the progress in this area has been in leaps and bounds. “Looking back, the following six reasons can be cited for this revolution,” opines Mapgaonkar:

- Rapid changes in technology

Technology in the spare parts and other parts that go into the automobile is changing so rapidly that unless one develops long-term relationship with the supplier, companies will find it difficult to cope. In our case, suppliers have been very forthcoming and have themselves suggested alternatives in terms of better quality or technology and lower price. A case in point is a carpet supplier, who himself suggested an alternative that was low cost and better looking and of superior quality. This has saved M&M considerable amount of money and most importantly got the satisfaction of giving the customer the best in the industry.

- Complexity in technology

Technology is not only changing rapidly, it is becoming more and more complex. And once again the only way to handle this complexity is by aligning with the suppliers. They understand the product they are supplying better and this makes them best fit in absorbing complex technology in products.

- Shorter product life cycles

The time that the product spends in the market is fast depleting. To top it further, customer memory is very short. Hence from the company’s perspective this means that after introducing one product, one cannot sit back

and relax. The process of creating a new product and introducing it quickly in the market goes on.

- Lead time shrinking for product introductions

Once again this puts a lot of pressure on suppliers and their cooperation in reaching the market fast. In the case of Scorpio, though time was not the main driver (customer satisfaction was) lead time for product introduction automatically came down because suppliers were completely involved at stage zero (conceptualization stage). As a result they got a lot of time to plan for themselves. The programme, specifications and other minor factors that can disturb the schedule were by and large, not changed even once. This is an important factor as going back and forth on plans will automatically increase the lead time. And of course, involvement in what the supplier is doing by giving him complete autonomy in deciding what is best for the vehicle. These solutions to reduce the lead time look and appear very simple but can go a long way in decreasing the lead time.

- Increasing cost pressure

Market margins are depleting by the day, thus putting pressure on cost savings accrued by way of buying low cost materials. If suppliers don't feel involved and committed they end up compromising on quality to justify low cost. But in the case of M&M, cost is the last thing they think about. For example, recently castings prices increased making it difficult for suppliers to supply at the pre-decided prices. "Instead of increasing the prices on their own, they all came to us and asked us to decide the best price for them because they had the complete faith that I will be fair to them while getting the best price for M&M," shares Mapgaonkar. Just like the supplier should build credibility in the eyes of the purchaser, the latter should also build credibility in the eyes of the supplier. Hence inculcating good relationship is the only way of overcoming cost pressure.

BENEFITS TO M&M

M&M has benefited tremendously by focusing on supplier relationships. Some of the advantages are:

- **Increased outsourcing:** Better relationships, more trust and hence more outsourcing. M&M has been able to steadily increase the percentage of outsourcing. Today close to 78 per cent of the parts come from vendors. This means we just need to make the critical components such as engines and focus all our energies on increasing the market share. The confidence we have built up by having good relationships with the suppliers have motivated us to increase outsourcing, feels Mapgaonkar. This is the best way of reaching the market fast.
- **Lean supply base:** The rationale for a large supply base was antagonistic relationships with the suppliers. This does not apply to AS, M&M at all. Relationship building over the years has resulted in them having to maintain a small supply base. As mentioned above, Scorpio has single sources for all the materials. "Some may feel, this is too much risk but we feel this is confidence and trust," says Mapgaonkar.
- **Systems and module buying:** System or module buying means buying an assembly rather than individual components. This helps by further decreasing the vendor base, quickening the product manufacturing process and most importantly reducing the cost (both direct and indirect). For example, Scorpio interiors were designed by an international company called Lear Corp. They were given complete responsibility for the interior of the product that includes the instrument panel, seats, carpet, all the plastic trim and the head liner. By making them completely responsible for the interior helped in several ways. For M&M this meant dealing with only one supplier for everything inside the vehicle at optimum cost. Lear was fully responsible for prototyping, engineering validation and tooling the interior. All the initial engineering work for the Scorpio was done in Italy, while instrument panel engineering was done in Sweden and the US, and the final design was done in India, as by this time Lear had set up an engineering centre in India. Lear could keep the tooling costs low by using some of the processes that had been proven in their R&D activity but not really implemented in mass production. For Lear this was the first time they were getting completely involved in the product from clay model to complete manufacturing. Incidentally, though they have experience of making interiors, this was the first time they were involved in making everything. Similarly for suspension, to keep the costs down M&M went

to Korea's Samlip Industrial Co. Ltd. (Going to US/Europe was a costlier option because of obvious reasons). Samlip had never done a complete suspension system and M&M gave them the complete business. Samlip hired consultants in Korea and worked with tyre supplier Bridgestone and steering supplier Koyo (Japan) to develop a suspension that would suit Scorpio. M&M gave them a benchmark vehicle and the task of being better or equal to that vehicle. In some sense this was a risk but now that this decision has paid off handsomely, this looks like a long-term thought out decision.

- **Co-design:** Co-design is once again a big risk and can only happen if one has trust and confidence in one's suppliers. The benefits of co-design are tremendous and Scorpio is a classic example of this. A case in point is a chassis supplier. Thakkar Sons has been a regular chassis supplier for other M&M brands and over the years, the companies have built up a wonderful relationship with each other. When Scorpio was at the design stage, they were called and asked whether they would like to participate in Scorpio. The condition was that they would have to supply a world class chassis which is made by world class technology. World class technology is one where chassis are made with minimal human intervention, with the help of robots. This obviously meant a lot of things for Thakkar Sons. One, they had to make a product in a completely different way than what they were used to. Secondly, they had to upgrade their facilities and bring them to world class standards. This meant investing a huge amount of money in order to reach the global standards. In return, M&M promised business—complete 100 per cent business. They immediately relented and collaborated with a Japanese company for technological knowhow and invested heavily in creating world class facilities. M&M was involved in all stages, i.e. a team from M&M visited Japan to understand the technology of the Japanese company, participated in talks with them, etc. The result is a chassis that has a tolerance of only ± 1 mm over its entire length as against the global standard of ± 3 mm. The supplier over and above getting complete Scorpio business has a state-of-the-art plant that is being operated by robots. In this way, M&M has minimized the risk of single sourcing as they know the who's and how's of the business. The biggest advantage however was that of cost. Getting the product from a European principal would have cost M&M a huge amount of money. Tremendous cost savings were accrued by this process. The supplier did not even once feel that

after all this effort, what if M&M gave business to somebody else? Trust and confidence in M&M built over the years motivated them to spend so much money for M&M.

- **Proactive communication:** Probably the greatest beneficiary of improved supplier relationship has been the communication with the supplier. From being reactive it has become proactive. This has allowed M&M to do business across commodities. That is, say for example, a supplier of product A, also has a core competency in making product B. Cordial relationships have encouraged him to share this fact with M&M and there have been instances when M&M have realized benefits by doing business across commodities with the same supplier. Obvious benefits are reduction in supplier base as the same person supplies more than one product. Some other advantages have been support in identification of competitive and useful sources.
- **Reduction in total cycle time:** As the suppliers are involved right at the beginning and participate at every stage of the process, total cycle time has got drastically reduced. Suppliers have become very sensitive to customer and market pressures and they wholeheartedly participate in reducing the total cycle time. M&M can always rely on their suppliers.

BENEFITS TO SUPPLIERS

No relationship can be one-sided. Unless the supplier finds some tangible and long-term benefits in the relationship, he will not participate. Hence the Best Practice lies in evaluating and maximizing the benefits that can be offered to the supplier. Some of the benefits to the supplier according to M&M are:

- **Assured business:** Supplier does not live from cycle to cycle, nor is he ever insecure between cycles. He knows come what may, his commitment, quality and timely response will always be appreciated and duly rewarded. This allows him to concentrate on other vital issues related to business such as ensuring good quality, value engineering, sourcing for better knowhow, etc. This way, not only does the company grow but the supplier also grows along with him. “We share our long-term business vision, i.e. our future plans with

them. This allows them to create their own business vision vis-a-vis M&M's plans," shares Mapgaonkar. This also helps them take vital decisions such as capacity expansion, technology upgradation etc., well in advance.

- **Advantages of M&M experience:** Suppliers always have an access to the rich and varied experience of M&M in handling exceptions. Once a large supplier suddenly complained of a spurt in labour problems which he feared would affect the schedule resulting in late deliveries. M&M, with a large staff and strong unions has experts who can handle such situations. A team of experts from M&M immediately visited the supplier and helped him in overcoming the problem. They spoke to the labour unions, management and all the parties involved and helped the supplier reach an amicable settlement. Though the supplier was the direct beneficiary, M&M was also indirectly benefited. The supplier could deliver on time without upsetting the schedule.
- **Anchoring support:** Sometimes the relationship with the supplier goes beyond products to reach at the human level, that surpasses all commercial considerations. To illustrate, a supplier of castings located at Kolhapur suddenly expired. M&M instead of terminating the contract and finding some other supplier supported his wife and helped her run the unit till she became confident of doing it on her own. And all this was done without relaxing any standards or without giving any special concessions.
- **Growth and development:** Once the supplier proves himself to M&M there is no looking back for him, in fact he is always assured of growth and development. As mentioned above, in the case of Scorpio, systems and module buying was the key. And in many cases, suppliers had no prior experience of supplying the complete system, despite which they were considered for the job. Suppliers had to spend time and money in getting expertise but in return they grew from being a part supplier to a module supplier.

UNIQUE SUPPLIER INITIATIVES

Giving autonomy and complete freedom to the suppliers has definitely been a key to M&M's success. But initiatives such as supplier upgradation and vendor development have also helped M&M bolster relationships with the suppliers.

- **Supplier upgradation initiative**

“With changing technology we don’t believe in changing suppliers. It is much easier to upgrade an existing supplier with whom great relationships have already been built,” philosophizes Mapgaonkar. “Great relationships can build loyalty but what we need to survive in this competition is core competence along with loyalty,” opines Ravi Wartikar, General Manager—Supplier Upgradation. “This initiative was aimed at bridging this gap between loyalty and competence,” he further adds. The goal of this initiative is *“to streamline manufacturing activities to achieve uninterrupted smooth flow of material from the receiving of raw material to dispatching of OK finished product within the shortest throughput time.”* Suppliers to be upgraded are chosen based on several parameters such as changing technology, product technology and process technology, customer feedback (internal customer, i.e. the supply module), whether the supplier is a strategic source, vendor rating, feedback from pricing cell, etc. A unique 19-step method has been devised which begins with choosing a vendor to identifying problems and interruptions that are affecting the vendor, to resolving them by formulating solutions, to implementing them to finally evolving a plan for sustaining gains. Such teams from M&M who work closely with the supplier are known as supplier technical assistance (STA) team. “Each STA becomes a part of the vendor and each STA’s performance is rated on the basis of supplier’s performance,” informs Sikka. Further the STA work with similar product vendors, hence success obtained at one vendor can be easily replicated at the other vendor’s facilities. In less than 18 months since this activity started, M&M has achieved more than Rs 2 crore by way of savings by this initiative. Savings achieved by the suppliers are shared by way of reducing the price or some other formula. A case in point, is a supplier at whose premises material used to move more than 14-kms from entering his premises as raw material to leaving the premises after getting converted to finished products. After the upgradation initiative they have to travel not more than a few metres. This has brought down the lead time drastically and has also positively impacted quality, inventory reduction, waste reduction, etc. His overall cost came down and he could thus afford to sell at a cheaper rate than before. “This is truly a novel system of helping suppliers to help us,” says Wartikar.

- **Supplier satisfaction survey**

Gauging and calibrating supplier's performance is done with great gusto and enthusiasm, but Mahindra believes in measuring supplier's satisfaction with the same zeal. Every year, once a year the Mahindra major suppliers will now rate Mahindra on its policies, costs, behaviour, negotiations, etc. A detailed analysis will help Mahindra's focus on areas that need change or improvement that will make them a supplier friendly company. "We are very serious about doing this and the results will be viewed very positively and used to create an atmosphere conducive for suppliers to optimize their performance," opines Sarangdhar.

- **Mahindrasuppliers.com**

There is nothing unique in having a website to communicate with the suppliers. What makes mahindrasuppliers.com unique is the way it has been designed. Launched about three years ago, this unique web initiative allows suppliers to know details on purchase orders, amendments if any, delivery schedules, reports related to receipts, information on rejections and most important payments at the click of the mouse. This is unique because all of this information is available consolidated for all the sectors, plants and locations. "The cost savings are tremendous both for us and for the suppliers as well," asserts Arun Walavalkar GM—Commercial. "They have saved money directly on phone calls, fax, personal visits, follow-ups, and indirectly on inventory reduction as schedules across nine locations are known in advance and they can plan properly," adds Pushkar Bhobe Manager—Plant Improvements and MIS. "While we have saved a lot of our time which otherwise used to be spent with these suppliers or answering their phone calls, the risk element has also come down significantly," adds Walavalkar.

While this initiative was a boon for the suppliers, it had a major flaw, that it was static and only one-sided. "We could send information to them but they could not reciprocate using the same medium," says Alpana Kulkarni from the MIS team. They had to use the traditional method to communicate with M&M. "Also we had a meeting with all the suppliers who use this regularly to understand what other problems they were facing while

using mahindrasuppliers.com and what value additions they want to make the site more user friendly and useful,” shares Bhobe. Based on supplier’s feedback and future requirements the next more advanced version of mahindrasuppliers.com is ready and is currently being pilot tested. This new version called MahindraSRM.com will be integrated with SAP and hence data transfer will happen smoothly without any human intervention. “The best part is that this is two-way and the moment suppliers look at the schedule or any other document on the site we will get a receipt that the supplier has used the site and knows the schedule,” shares Walavalkar. Not only this, M&M has tied up with HDFC bank for ECS facility wherein funds can be transferred electronically to the supplier’s accounts. “And this is just the beginning, we can do a lot of things to use the web to make our suppliers comfortable so that they can concentrate on quality and time without bothering about payments, follow-ups etc.,” feels Walavalkar.

- **Cluster programme for ISO certification**

Several suppliers who were from the small and medium sector felt the need to get an ISO certification but could not afford to do so. M&M also needed all suppliers to be ISO certified. So M&M brought all of such suppliers together prepared clusters of 15–20, each based on criterion such as geography, type of product supplied, volume, etc. and then brought in the top notch ISO consultants and assigned them to such clusters. They not only got group discount from the consultant but doing it together was a different experience altogether. “It worked like a tripartite arrangement where we negotiated with the quality consultants, we laid down the rules, we also paid the consultants and they trained our suppliers while constantly updating us,” says Sikka. Everybody benefited—M&M obviously as now they have most of the suppliers small or big ISO certified, suppliers by getting a world class status and consultants by getting so many clients in one shot.

FACTOR DETERMINING APPROPRIATE SUPPLIER

Getting a supplier and getting an appropriate supplier are two different things. Vendor selection is an extremely focused approach and is done by the Strategic Sourcing department. “We choose the supplier base based on several parameters,

but most vital is of course a possibility of establishing a long-term and sustainable relationship,” says Jambavdekar. “This is not only a sound approach to choosing suppliers but extremely safe as well,” opines Girish Bhobe, DGM, Strategic Sourcing. “I can say this because we have devised a foolproof methodology for choosing a supplier leaving absolutely no scope for any ad hoc or impulsive decisions,” Bhobe further adds. The whole process of Strategic Sourcing starts from scratch where business needs analysis is done. This includes understanding of M&M’s business—current and future and relating it to the supplier and his growth. “Since suppliers chosen by us will be long term, it is important that they grow in the same proportion as we grow,” feels Jambavdekar. The next step is spend analysis, i.e. understanding the current spend on the particular product and the likely spend in the future. Market intelligence is collected, i.e. how the market, competition, other suppliers, supplier’s suppliers, i.e. his raw material market, etc. The goal is to choose a supplier who is appropriate for M&M, who need not be the best, but will support a long-term and sustainable relationship. “We choose the one who is capable of meeting our current and future requirements with respect to quality, technology and price,” points Jambavdekar. “This supplier need not be best in the world but is best for us,” Mapgaonkar adds. But at the same time it is important to know the best practices prevalent around the world as this can be a good input in the selection process. “We visit the company we feel has best practices wherever they are, around the world to assimilate and understand the latest trends,” reveals Bhobe. The next step is formulation of a cross functional team (CFT) which is constituted based on the product, process technology, cost, etc. This CFT evaluates the supplier base from all the angles. Another practice unique to M&M is calculation of the total acquisition cost (TAC) and using this in the decision making process. TAC includes both invoice price as well as acquisition which include cost of quality, inventory, tax, transport, etc. A detailed questionnaire is constructed next which includes all aspects such as product technology vs. process technology, supplier’s current capability vs. future plans, relationship building initiatives such as ability to become a co-maker etc. Each supplier from the supplier base fills up this questionnaire. Each sector, subsector in the score card has an appropriate weightage assigned to it and based on the information, vendor’s score is calculated. This helps them shorten the supplier base and get the first shortlist. The process continues with the CFT visiting these shortlisted suppliers and taking a facility tour, formally meeting and quizzing the top management and other decision makers, understanding their compulsions, their cost structure, their raw material market, its variations, future

plans, targets, expectations, etc. This helps them get a complete idea on the supplier and what makes him tick. “In many cases, we have even evaluated and spoken with the second-tier supplier,” adds Bhobe. The pricing cell takes over after the final shortlist is made to negotiate a fair price. “We discuss cost and not the price,” declares Jambavdekar. “Reduction in cost is a byproduct of the strategic sourcing department, the main aim is to create relationships that are long term and sustainable,” adds Bhobe. The whole process can take anything from seven to eight months. But at the end of the process they have a supplier base that is lean, competent, growth oriented, believes in relationship building and is appropriate, i.e. who understands their language and is forward thinking.

VENDOR RATING

The formality of rating a vendor is extremely important and once again can provide a good input to the company’s thinking about the supplier. Sharing of performance rating with the vendor in the manner in which it encourages him and motivates him to excel should be a priority item.

At M&M the supplier is evaluated at three stages:

1. Evaluation for supplier selection.
2. Evaluation for continuous performance.

EVALUATION FOR SUPPLIER SELECTION

This exercise happens while choosing a supplier. It assesses the supplier from several angles. Technical capabilities with respect to both production and processes gives an idea on how much forward thinking and savvy the supplier is. A study of his manufacturing system tells about his capacity, type of assembly line, etc. His quality systems reveal not only his overall attitude to quality but specifically to quality related to manufactured output. And finally his operating systems talk about his inventories, his supply chain, his suppliers, his relationship with them and all that is required to operate flawlessly with low costs. This exhaustive system determines his overall ability to execute a given job in the decided time frame, at low cost while maintaining a high quality.

“A lot of thinking and a lot of brainstorming has gone into the process,” confides Mapgaonkar. Appropriate weights are assigned to all the above-mentioned criteria and an average score is plotted. Suppliers are chosen on the basis of these scores, hence it is mandatory that they are appropriate and fair and reveals a true picture.

EVALUATION FOR CONTINUOUS PERFORMANCE

This module is done every quarter, i.e. four times a year. The criteria range from quality and price to general management and delivery. Each of these criteria is further divided into subcriteria and so on. “Several of the qualitative variables have been quantified by assigning appropriate weights to them,” says Sarangdhar. The quantitative data is fed directly and updated from SAP and hence updated instantaneously, while the qualitative data that needs to be filled up manually is done once in a quarter. These ratings are consolidated across plants, parts and locations. “Most importantly this data is shared with the suppliers and they are encouraged to discuss the ratings with us,” shares Sarangdhar. “Usually companies do not like suppliers questioning the ratings, but we encourage our suppliers to ask us why we have rated them in a particular manner,” adds Sarangdhar. This not only makes the whole system transparent but encouraging.

CONCLUSION

It is difficult to develop and nurture even one relationship but in the case of AS, M&M have taken upon themselves to nurture hundreds of relationships. “The overall experience has been extremely rewarding and satisfying,” reminisces Mapgaonkar. He further adds that “In times of crisis when I see suppliers stand by us, I feel vindicated that our policies are the right way of vendor management.” Everything cannot be based on relationships as some products are ‘by the market’ and prices are ‘of the moment’ kind. “It will be absolutely great if one can develop and foster relationships even for these type of products obviously while focusing on competitiveness,” feels Mapgaonkar.

“It is not only important to be ethical but being ethical also helps,” advises Mapgaonkar. Even small things like carrying information about one supplier to the other supplier or crediting suppliers with designs can have long-term benefits. It is

important to build credibility with the supplier. “Do the best job for the company but this can also be done while being fair to the supplier,” advises Mapgaonkar.

(With inputs from Mr Jonathan Mapgaonkar, Mr Vikas Sarangdhar, Mr Prashant Kharkar, Mr Ravi Wartikar, Mr Hemant Sikka, Mr Girish Bhobe, Mr Rajiv Jambavdekar, Mr Mohan Upadhye, Mr Arun Walawarkar, Mr Pushkar Bhobe and Ms Alpana Kulkarni and with support from Ms Shweta Karkhanis.)

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Reliability and Quality Management

It costs five times as much to find a new customer than it does to keep an existing one. If you retain only 2 per cent of your customer base, you'll reduce your operating costs by 10 per cent and increase your profits by 34 per cent. Statisticians calculate that if you increase your average customer retention from an annual 80 per cent to 90 per cent, you'll double the total lifetime value of your customer base.

— Peter Cheales; Famous S.African Speaker & Motivator.

Reliability is defined as the ability of a system or component to perform its required functions under stated conditions for a specified period of time. Quality has several definitions given by several people. While Deming feels that quality is pride in workmanship, Juran calls quality as fitness for use. Donald Wheeler and Donald Chamber thought that zero defect is not good enough, while Philips Crosby propagated that quality should be free. "Quality should be defined as surpassing customer needs and expectations throughout the life of the product." For any organization it is essential to combine the elements of quality with a strong and effective reliability, and maintainability programme is a critical prerequisite if an organization hopes to achieve customer delight each and every time.

Although the terms reliability and quality are often used interchangeably, there is a difference between these two disciplines. While reliability is concerned with the performance of a product over its entire lifetime, quality control is concerned with the

performance of a product at one point in time, usually during the manufacturing process. As stated in the definition, reliability assures that components, equipment and systems function without failure for desired periods during their whole design life, from conception (birth) to junking (death). Quality control is a single, albeit vital, link in the total reliability process. Quality control assures conformance to specifications. This reduces manufacturing variance, which can degrade reliability. Quality control also checks that the incoming parts and components meet specifications, that products are inspected and tested correctly, and that the shipped products have a quality level equal to or greater than that specified. The specified quality level should be one that is acceptable to the users, the consumer and the public. No product can perform reliably without the inputs of quality control, because quality parts and components are needed to go into the product so that its reliability is assured.

Reliability is an engineering discipline with specific principles. Reliability applies scientific knowhow to a component, assembly, plant or process so it will perform its intended function, without failure, for the required time duration when installed correctly and operated correctly in a specified environment.

If reliability terminates in a failure, then businesses incur the high cost of unreliability. High cost motivates engineering solutions to reliability problems for controlling and reducing costs. Reliability is the capacity of equipment or processes to operate without failure. Failure causes reliability problems that waste money. The business issue of reliability is prevention and control of failures to reduce costs for improving customer satisfaction. Enhancing reliability satisfies customers for on-time deliveries through increased equipment availability and by reducing costs and problems from products that fail early. Reliability has time-dependent impact on product, quality, process quality and the costs of unreliability.

Companies the world over are focusing their attention on reliability as they have realized that if they want to succeed in today's highly competitive environment where the customer is demanding, the stakes are high and technology complex. It has become absolutely mandatory to ensure the reliability of its products where the companies are able to control the reliability so it can produce products at an optimum reliability level.

Our growing total dependence on technology requires that the products that make up our daily lives work successfully for the desired or designed-in period of time. It

is insufficient for a product to work for a time shorter than its mission duration. At the same time, there is no need to design a product to operate much past its intended life, since it would only impose additional costs to the manufacturer. In today's complex living where we do almost everything with automated equipment, we are totally dependent on the successful operation of these equipment (their reliability) and on their quick restoration to function (their maintainability) if they fail.

Product failures range from failures that cause minor nuisances, such as a television's remote control, to catastrophic failures, such as an aircraft accident. Reliability engineering was born out of the necessity to avoid such catastrophic events. It is not surprising that Boeing was one of the first commercial companies to embrace and implement reliability engineering, the success of which can be seen in the safety of today's commercial air travel.

It is extremely vital that reliability engineering gets applied to all products. The previous example of the failed remote control does not have any major life and death consequences to the consumer. However, it can pose a life and death risk to a nonbiological entity: the company that produced it. Today's consumer is more intelligent and product-aware than the consumer of years past. This consumer will no longer tolerate products that do not perform in a reliable fashion, or as promised and advertised. Customer dissatisfaction with a product's reliability can have disastrous financial consequences to the manufacturer. Statistics show that when a customer is satisfied with a product they might tell eight other people; however, a dissatisfied customer will tell 22 people, on an average.

The critical applications with which many modern products are entrusted make their reliability a factor of paramount importance. For example, the failure of a computer component will have more negative consequences today than it did twenty years ago. This is because 20 years ago the technology was relatively new and not very widespread, and one most likely had backup paper copies somewhere. Now, as computers are often the sole medium in which many clerical and computational functions are performed, the failure of a computer component will have a much greater effect.

DEFINITION OF RELIABILITY

Reliability engineering provides the theoretical and practical tools whereby the probability and capability of parts, components, equipment, products and systems

to perform their required functions for desired periods of time without failure, in specified environments, and with a desired confidence can be specified, designed in, predicted, tested and demonstrated.

RELIABILITY ENGINEERING AND BUSINESS PLANS

Reliability engineering assessment is based on the results of testing from in-house (or contracted) labs and data pertaining to the performance results of the product in the field. The data produced by these sources are utilized to accurately measure and improve the reliability of the products being produced. This is particularly important as market concerns drive a constant push for cost reduction. However, one must be able to keep a perspective on 'the big picture', instead of merely looking for the quick fix. It is often the temptation to cut corners and save initial costs by using cheaper parts or cutting testing programmes. Unfortunately, cheaper parts are usually less reliable and inadequate testing programmes can allow products with undiscovered flaws to get out into the field. A quick savings in the short term by the use of cheaper components or smaller test sample sizes will usually result in higher long-term costs in the form of warranty costs or loss of customer confidence. A proper balance must be struck between reliability, customer satisfaction, time to market, sales and features.

DISCIPLINES COVERED BY RELIABILITY ENGINEERING

Reliability engineering covers all aspects of a product's life, from its conception, subsequent design and production processes, as well as through its practical use lifetime, with maintenance support and availability. Reliability engineering covers:

- reliability
- maintainability
- availability

All three of these areas can be numerically quantified with the use of reliability engineering principles and life data analysis.

TOTAL PREVENTIVE MAINTENANCE

Reliability engineering principles complement TPM efforts by supplying hard facts and engineering solutions to speed implementation and reduce costs.

A Few Common Applications

The reliability bathtub curve and burn-in

Most products (as well as humans), exhibit characteristics as shown in the bathtub curve illustrated below. (Do note that this illustration is somewhat idealized.)

This curve is plotted with the product life on the x -axis and with the failure rate on the y -axis. The life can be in minutes, hours, years, cycles, actuations or any other quantifiable unit of time. The failure rate is given as failures per such time unit.

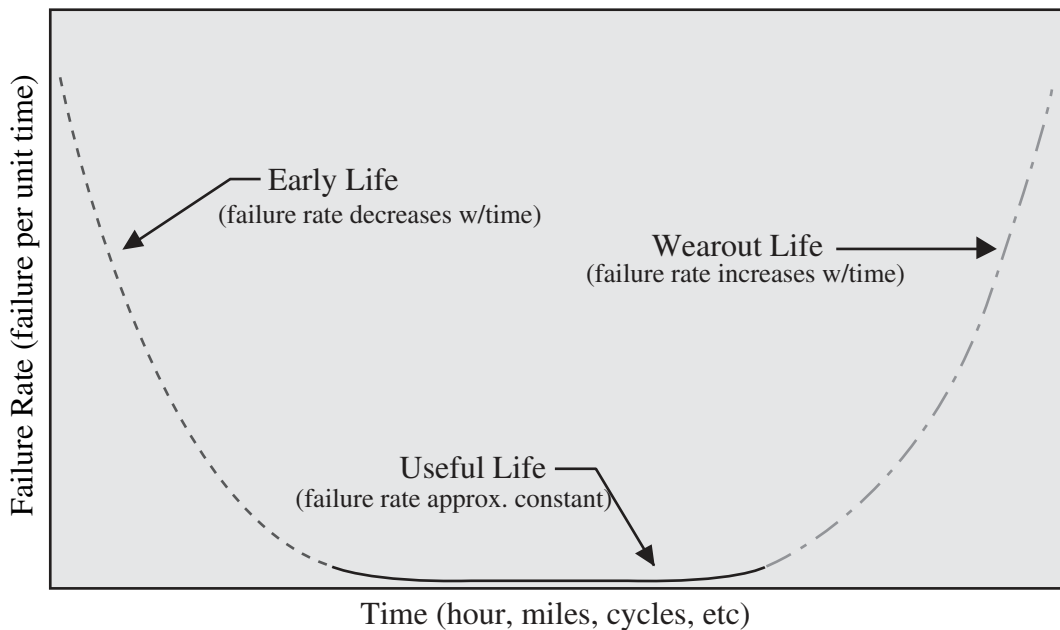


Figure 8.1 An idealized reliability bathtub curve, with the three major life regions: early, useful and wearout

As can be seen from Figure 8.1, most products will begin their life with a higher failure rate (which is due to manufacturing defects, poor workmanship, poor quality control, etc.) and exhibit a decreasing failure rate.

The failure rate then usually stabilizes to a constant failure rate during the useful life region, where the failures observed are chance failures and then proceed to the wearout life where the failure rate increases rapidly with time.

In the case of human mortality, the mortality rate (failure rate), is higher during the first year or so of life, then drops to a low constant level during our teens and adult life and then rises as we progress in years.

Burn-in

Looking at this bathtub curve, it should be obvious that in this case it is best to ship a product at the beginning of the useful life region rather than right off the production line, thus eliminating the early failures. This practice is what is commonly referred to as burn-in and is frequently used for electronic components. The determination of the correct burn-in time requires the use of reliability methodologies as well as optimization of costs involved (i.e. costs of early failures vs. the cost of burn-in) vs. the optimum failure rate at shipment.

Minimizing the Manufacturer's Cost

Figure 8.2 shows the product reliability on the x -axis and the producer's cost on the y -axis.

If the producer increases the reliability of his product, he will increase the cost of the design and/or production of such a product. However, a low production and design cost does not imply a low overall product cost. The overall product cost should not be calculated as merely the cost of the product when it leaves the shipping dock, but as the total cost of the product through its lifetime. This includes warranty and replacement costs for defective products, costs incurred by loss of customers due to defective products, loss of subsequent sales, etc. By increasing product reliability, one may increase the initial product costs, but decrease the support costs. An optimum minimal total product cost can be determined and implemented by calculating the

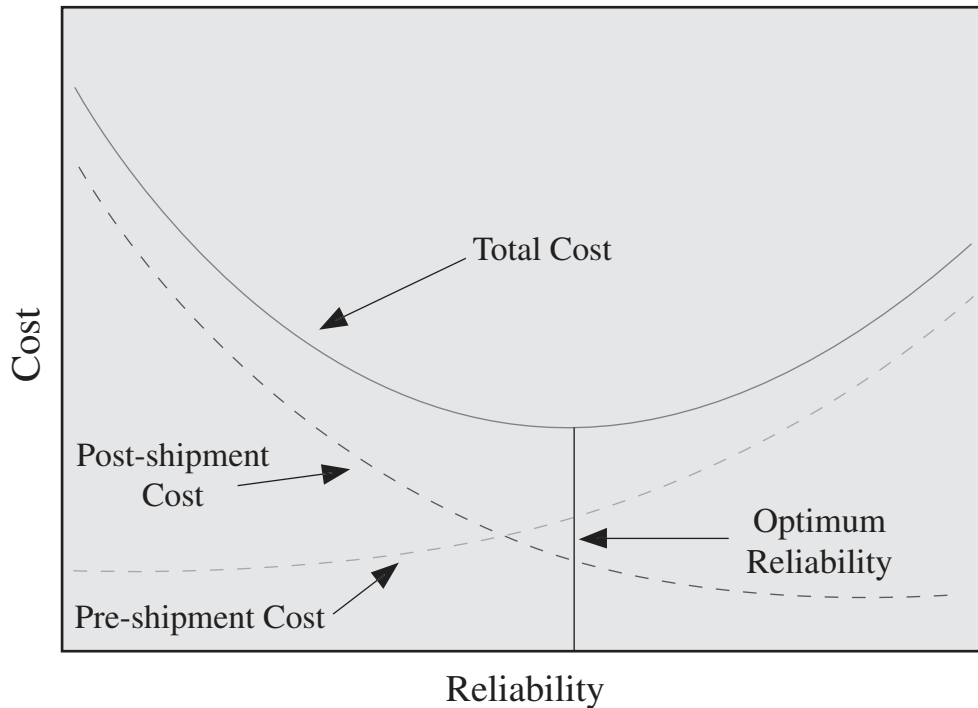


Figure 8.2 Total product cost vs. product reliability

optimum reliability for such a product. The figure above depicts such a scenario. The total product cost is the sum of the production and design costs as well as the other post-shipment costs. It can be seen that at an optimum reliability level, the total product cost is at a minimum. The optimum reliability level is the one that coincides with the minimum total cost over the entire lifetime of the product.

ADVANTAGES OF A RELIABILITY ENGINEERING PROGRAMME AT THE COMPANY

The following are some of the advantages that are accrued by the implementation of a sound reliability programme:

- Optimum burn-in time or breaking-in period.
- Optimum warranty period and estimated warranty costs.

- Optimum preventive replacement time for components in a repairable system.
- Spare parts requirements and production rate, resulting in improved inventory control through correct prediction of spare parts requirements.
- Better information about the types of failures experienced by parts and systems that aid design, research, and development efforts to minimize these failures.
- Establishment of which failures occur at what time in the life of a product, and better preparation to cope with them.
- Studies of the effects of age, mission duration and application and operation stress levels on reliability.
- A basis for comparing two or more designs and choosing the best design from the reliability point of view.
- Evaluation of the amount of redundancy present in the design.
- Estimations of the required redundancy to achieve the specified reliability.
- Guidance regarding corrective action decisions to minimize failures and reduce maintenance and repair times, which will eliminate over-design as well as under-design.
- Help providing guidelines for quality control practices.
- Optimization of the reliability goal that should be designed into products and systems for minimum total cost to own, operate and maintain for their lifetime.
- The ability to conduct trade-off studies among parameters such as reliability, maintainability, availability, cost, weight, volume, operability, serviceability and safety to obtain the optimum design.
- Reduction of warranty costs, or for the same cost, increase in the length and the coverage of warranty.

- Establishment of guidelines for evaluating suppliers from their product reliability point of view.
- Promotion of sales on the basis of reliability indexes and metrics through sales and marketing departments.
- Increase of customer satisfaction and an increase of sales as a result of customer satisfaction.
- Increase of profits, or for the same profit, provision of even more reliable products and systems.
- Promotion of positive image and company reputation.

REASONS FOR IMPLEMENTING A RELIABILITY ENGINEERING PROGRAMME

The typical manufacturer does not really know how satisfactorily his products are functioning. This is usually due to a lack of a reliabilitywise viable failure reporting system. It is important to have a useful analysis, interpretation and feedback system in all company areas that deal with the product from its birth to its death.

If the manufacturer's products are functioning truly satisfactorily, it might be because they are unnecessarily overdesigned, and not designed optimally. Consequently, the products may be costing more than necessary and lowering profits.

Products are becoming more complex yearly, with the addition of more components and features to match competitors' products. This means that products with currently acceptable reliabilities need to be monitored constantly as the addition of features and components may degrade the product's overall reliability.

If the manufacturer does not design his products with reliability and quality in mind, SOMEONE ELSE WILL.

(Credits: With inputs from ReliaSoft. ReliaSoft Corporation provides reliability analysis software, training, consulting and services for reliability engineering and related fields.)

CASE STUDY

Reliability Management at Asian Paints

“Reliability management is one of the solid pillars on which SCM rests upon and functions efficiently,” propagates Vikram Jaisinghani, GM—Manufacturing at Asian Paints. For him and for Asian Paints, reliability is a broad concept that encapsulates everything from a vendor’s reliability, to process reliability, to operations reliability and to human reliability.

Very succinctly he divides the whole process of supply chain into aids or enablers and drivers. Aids or enablers encompass all the software tools such as planners, B2B solutions, schedulers, etc. All of these can function efficiently and give good results only when ground realities are taken care of. These ground realities are nothing but the drivers of supply chain which can be show-stoppers if they are not properly handled and immediately taken care of. These drivers of supply chain are nothing but what reliability is all about, declares Jaisinghani. He calls this the ‘R’ factor. Imagine the following scenario:

Software tools and enablers prepare a robust production plan based on estimates. These plans are then broken down (once again enablers do this activity) into bill of materials (BOM) and communicated to the suppliers. Suppliers also consent to producing and supplying the necessary material on time. And then, suddenly the following developments take place:

- 1) Vendor’s plant develops some problem which cannot be resolved on time and as a result of this he cannot supply on time.

Result: Source and procure material from elsewhere. Which means either start the process all over again or always have an alternative vendor on the rolls. And of course the third alternative is to wait for the material by allowing to let the

production process go for a hay way. None of the above alternatives will be easy on the bottom line.

- 2) The material coming from the vendor does not adhere to the quality norms set by the company. Results, of course, are batch rejection and return of the delivered material.

Result: Source and procure material all over again either from the same vendor or find another vendor. Wait till the material that adheres to the necessary quality is supplied by the vendor, or have the necessary material in inventory always to take care of such incidents.

- 3) Everything is alright at the vendor's front but due to some unforeseen flaw in the manufacturing process, production gets halted. And all the plans and schedules go for a toss.

Result: Loose sale, loose customers, loose profits, loose money and loose reputation.

- 4) Suddenly a fire takes place in the manufacturing facility and results in everything getting burnt. The fire was not detected in time and hence results in heavy losses.

Result: Loose sale.

The processes are not environmentally friendly and as a result, a raid by the environment protection secretariat halts work and manufacturing for some time.

Result: Halt manufacturing, loose sale, loose customers, loose profits, loose money and loose reputation.

- 5) Suddenly the worker's union decides to go on a flash strike and decides to stay away from the production facility.

Result: Agree to the union's demand without bothering about the long-term implications, or do not agree to the demands and sacrifice production plans, etc.

All of the six issues discussed are the showstoppers and can have long-term implications on the supply chain, bottomline and overall growth of the company. These are nothing but the drivers of supply chain and the business.

There is one solution to all of the above problems:

“Make all the processes, systems, and drivers completely reliable.”

Reliable systems, reliable processes, reliable people, reliable vendors, etc. all form the backbone of supply chain management and hence of any business. Any problem anywhere can be a big showstopper and can ruin all the plans, projections, schedules as prepared by the enablers, i.e. SCM software, etc.

Reliability has the following five pillars:

- 1) **Quality:** Quality of all the processes, systems, materials and people.
- 2) **Environment:** Emissions from the plant, environmental concerns and protection.
- 3) **Safety:** Safety of the plant and machinery and material and people from unnatural calamities such as fire, etc.
- 4) **People:** People, i.e. workmen who are productive and think for the company.
- 5) **Materials:** Vendors delivering quality material on time, every time.

In the early nineties, Quality was inspection and it was a matter between production and quality control. During the year 1992, APIL decided to work on ISO 9001–1987 Quality System standard for its Mumbai Plant. The Mumbai Plant got certified in June 1995 to ISO 9001–1994 standard. The plant has the distinction of being the first in the Indian paint industry to merit this recognition.

Between 1995 and 1997, two other plants, viz. Patancheru and Ankleshwar also got certified to ISO 9001–1994 standard.

The period from 1995 to 1999 saw the consolidation of quality systems in Asian Paints under the ISO 9001:1994 standards. The period saw increased awareness about quality and the company saw significant improvements in important quality parameters like approval with deviations (AWD's) and rejections in finished goods, raw and packing materials and intermediates in both trade as well as industrial paints.

Pillar One: Quality Movement at Asian Paints

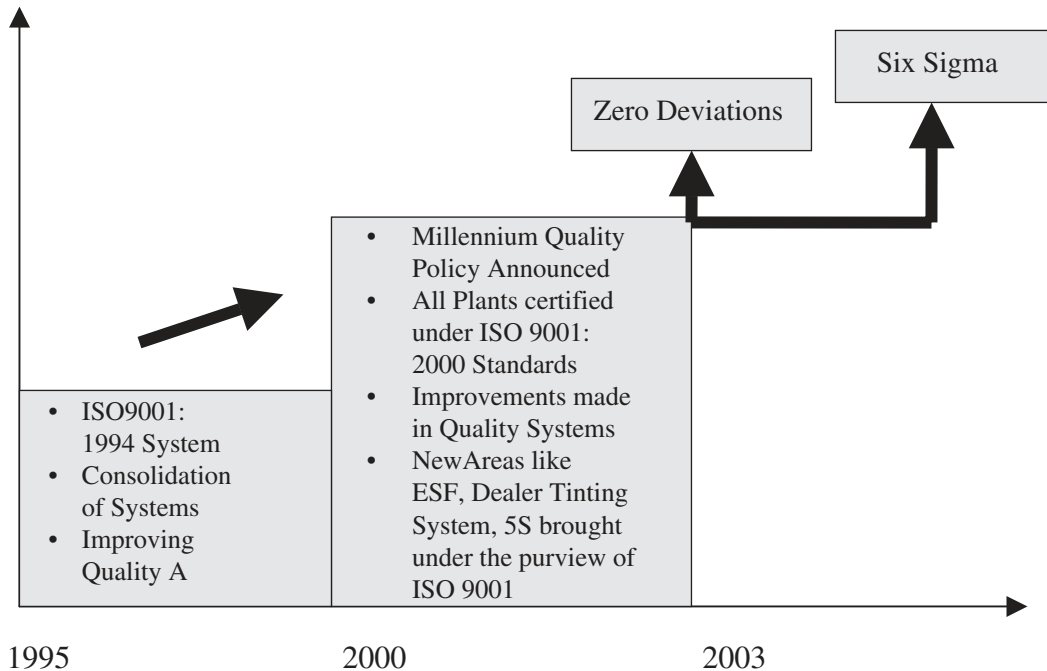


Figure 8.1 Quality movement through the years

After having consolidated its quality systems in the late nineties, the new millennium saw the company taking much bolder initiatives in the area of quality. The company's intent was brought about clearly in the Millennium Quality Policy that was launched on January 1, 2000.

The Millennium Quality Policy states the company's intent to do things right the first time as well as adopts the Phillips Crosby standard of zero defects.

Apart from stating the bold intentions of the company in the area of quality, it also set about bringing many key areas of operations as well as initiatives under the purview of the quality systems. Areas like engineering services, dealer tinting system and initiatives like 5S were brought under the fold of quality systems.

The company also started looking at quality systems more from the process point of view than functional in nature. It identified 20 key customer-impacting

processes like new product introduction, customer feedback process, customer complaints handling process, design and development process, standardization process, etc. and assigned a process owner to each of these key processes. The management and improvement of these processes is now the responsibility of the process owners who are General Managers and above in the organization's hierarchy.

The post-2000 period saw active initiatives taken by the company under the new policy guidelines. Under the new guidelines, the targets for any deviations in finished goods, raw and packing materials, and intermediates were brought down to ZERO. The aim was to make ZERO as the absolute standard and avoid any recurrences in case a deviation occurred. The company saw its deviations plummeting still further in all areas post-2000. Some of the charts below clearly indicate these trends.

After attacking the area of deviations in product quality, the company shifted its focus to reworks. Reworks are nothing but lost opportunities and indicate the levels

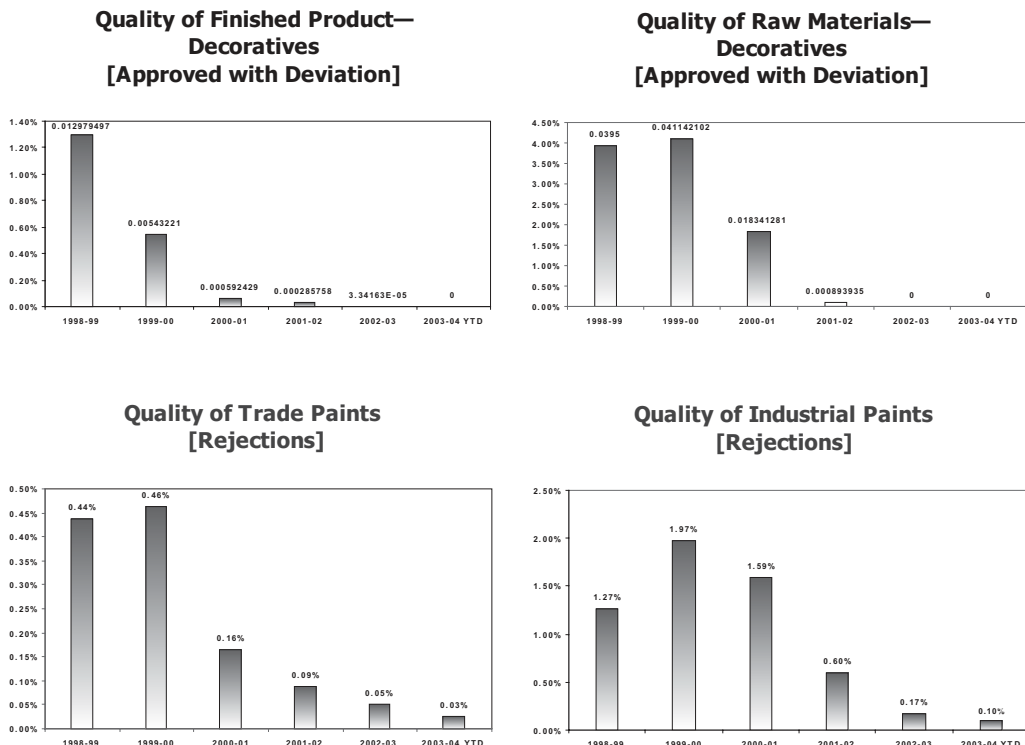


Figure 8.2 Quality improvement through the years

of waste in the process. The company tracks several measures of cost of poor quality that give an indication of reworks.

In order to bring about improvements in quality performance in this area, the company started training its employees in Six Sigma. The movement in Six Sigma (under the banner of root cause analysis) made inroads in the organization first in manufacturing function and has spread across the entire supply chain and technical functions.

The Six Sigma initiative has been lead by the senior management of the organization right from early days. The GM—Manufacturing under whose leadership the initiative has spread to the entire organization is a certified Master Black Belt in Six Sigma. The GM—Materials is a certified Black Belt in Six Sigma as well as certified quality engineer (by ASQ). All the factory managers are fully trained and practising Six Sigma Green Belts. They themselves participate in conducting review of all Six Sigma projects in their respective plants.

The function is targeting to train its entire staff in Green Belt Six Sigma training programme. Apart from the Green Belts, there are Six Black Belts in manufacturing and Two in technology who have undergone Six Sigma Black Belt training programme and are deployed full time on Six Sigma projects.

The top management has taken several steps to institutionalize Six Sigma ('Root Cause Analysis' initiative as it is rechristened in Asian Paints) in the organization. In order to increase the reach of the RCA Initiative to all employees, this year the Green Belt training programme was made mandatory for all staff in manufacturing function. All staff/executives/managers undergoing Green Belt training programmes are expected to deliver at least one successful project in a financial year. The competence and performance of an employee in RCA has been linked to the performance feedback and measurement system.

The company places a lot of focus on the problem-selection criteria. It is ensured that the projects selected by the individuals are linked to the business goals of the organization. This has been done by making a project charter for every project and proper selection of the local and global indices that the project proposes to impact. The team leader also has to calculate the cost of poor quality and difference between the entitlement and the 'As Is' of the process that gives him an idea of the

potential scope of improvement. Apart from the above checks, there is a list of themes released by the GM—Manufacturing under which the project selection is allowed.

These themes are

Cost

Waste Minimization

Cycle Times

Quality

Standardization

The themes broadly cover the critical business requirements that are to be met by the manufacturing function and help to integrate the projects to these requirements.

A separate structure of a team has been released and is currently being followed in the manufacturing function. A team is composed of a team leader who should be at least a Green Belt in the organization. He along with his team members are the actual doers and ensure that the time lines of the project are being met and that the DMAIC methodology is applied with adequate rigour and discipline.

The team is supported by project guide and a project champion. The project guide necessarily is a Black Belt who reviews the progress of the project and gives inputs to the team regarding proper statistical tool selection, data collection and analysis of the results. He ensures the rigorous application of DMAIC methodology. The project champion supports and ensures ownership of all implementers. He ensures that any resource constraints of the team are resolved; coordinates interdepartmental issues if they arise and ensures that the improvements suggested by the team are implemented by all individuals concerned.

All cost-related projects are signed off by the team with the administration manager and the improvements arising as a result of the project are incorporated in the budgets for the current as well as future financial years.

The factory manager of the plant is the overall champion of the initiative who supports the entire initiative and decides how the RCA initiative is deployed in his plant.

All improvements arising out of the projects are either locked in the financial budgets or procedures/work instructions of the quality system. These projects are then shared with the rest of the organization in the best practices meets organized regularly. The manufacturing function completed 102 projects in the FY 2002–03.

The company plans to increase the reach of Six Sigma initiative from the supply chain and technology to the rest of the organization in the next two years.

Pillar Two: Environment at Asian Paints

Asian Paints drafted its environmental policy in the year 2001, recognizing the need to focus on environment protection in its chosen role as a responsible corporate citizen. Through this policy, the company has committed itself to pollution prevention, statutory compliance and continual improvement towards achieving “Clean Environment”. Over Rs 15 crores have been invested towards this objective in the past three years.

Environment friendly production processes, have benefited the organization three-dimensionally, viz.

- Material productivity
- Natural resource conservation
- Cleaner environment

Besides the benefits accrued in each area as detailed above, the image of being an environmentally responsible stakeholder has strengthened in true spirit. The path ahead is to sustain the current results and improve them further. The company now has to play a larger role in the society by being a role model and also sensitizing the community towards environment through various communication channels.

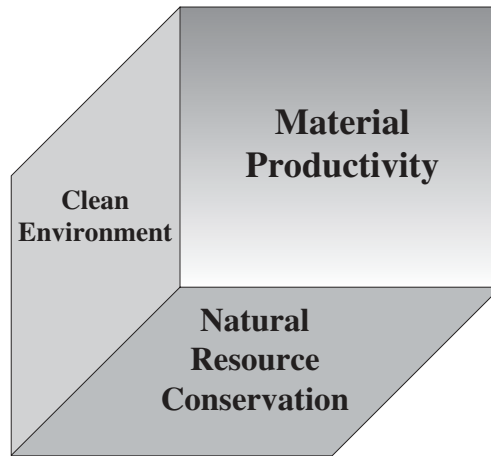


Figure 8.3 The three dimensions of environment

The company has adopted “Environmental Management System” as per ISO 14001 specifications with a view to enhance environmental performance. This system integrates material productivity and environmental protection. As part of this, environmental agenda of the plants has been categorized into four basic elements, viz.

Few details of these elements are enlisted below.

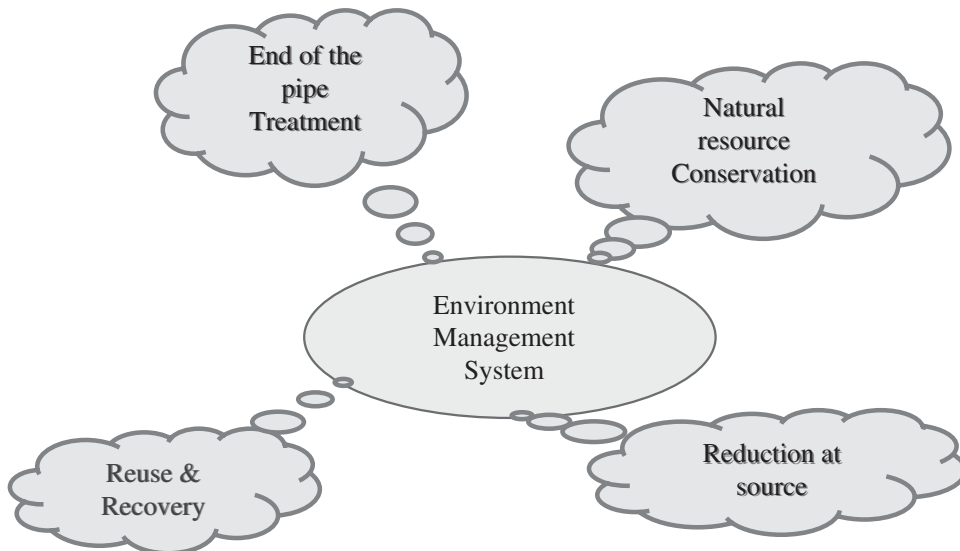


Figure 8.4 Basic elements of environmental management system

A) Reduction at Source

There was a strong need for making the frontline supervisors relate to the waste generated from the processes managed by them. A strong quantification of the waste generated from individual processes would lead to people owning the outcomes. The feedback and control mechanisms would in turn be effective. The purpose was met by conducting **mass balance audits (MBA)**.

MBA studies comprise measuring waste generated in each stage in the production process and identifying waste minimization/elimination opportunities. The identified opportunities are considered for arriving at the environment management programmes (EMP). Each EMP is tracked, controlled at shop floor as a result of which significant benefits have been realized.

An example of an MBA is given below:

	TOTAL INPUT			TOTAL OUTPUT	
Stage no		Quantity			Quantity
1	Pre-emulsion preparation	3901.85		Actual output	4987
2	Reactor charging stage	877.35			
3	Pre-emulsion addition	0			
4	Digestion	52			
5	Discharging	60	Sr.No.	Waste category	Quantity
6	Addition of additives	84	1	Floor spillage	0.15
7	Filtration	60	2	Left over in carboys	1.2
8	Packing	0	3	Sampling loss	1
			4	React or sticking losses	33.22
			5	Strainer residue-filtration	0.45
	RM handling losses	1.35	6	Strainer residue-packing	1
			7	Blender sticking	
			8	Pre-emulsion tank sticking	
				Unaccounted	12.53
				Total losses	49.55

Total input = 5036.55 kg

Total output = 5036.55 kg

Reduction at source includes practices that reduce any waste, hazardous substance, pollutant prior to their recycling.

This has been achieved by a combination of various measures:

- a MBA, as explained above,
- b Daily monitoring system of all types of waste generation at each source,
- c Segregation of waste into hazardous and non-hazardous material and giving the required treatment. Implementation of waste segregation system,
- d Optimizing batch cycles and streamlining production scheduler so as to minimize changeovers which require cleaning of production equipment,
- e Design of environment friendly ingredients-based formulations, and
- f A host of good manufacturing practices implemented at the shopfloor along with mass awareness building, targeting reduction of waste at source

The initiatives undertaken as 'reduction at source' measures include fall in generation of waste effluent, solvent, solid, packing material and organic load in ETP. The progress on a few parameters is as under:

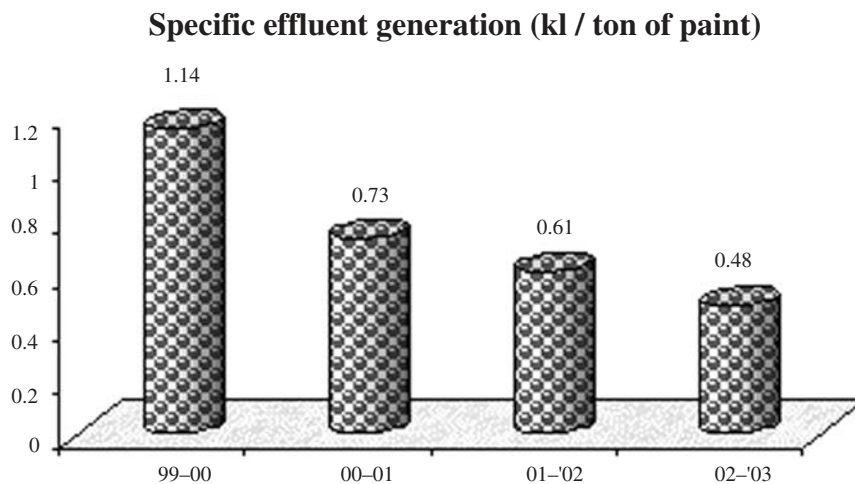


Figure 8.5 Reduction in waste

Packing material losses have reduced from over Rs 1Cr l to Rs 27 l

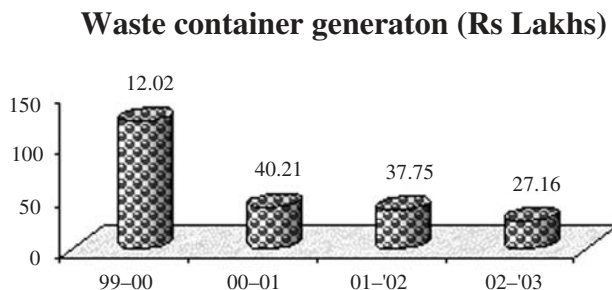


Figure 8.6 Reduction in packing material losses

B) Reuse and Recycle

Reuse and recycling is the next most favourable option following reduction at source. This methodology is advantageous for a number of reasons: it conserves natural resources, avoids waste treatment and disposal and reduces the need for addition of fresh raw materials to the process.

Few of the major initiatives taken under this category are:

- I. Segregation and recycle of samples used for testing.
- II. Reuse of paint scrapings.
- III. Recycling of waste materials to produce lower end products.
- IV. Recovery of material from effluent streams for re-use in lower end products.
- V. Reuse of water and solvents used in cleaning of equipment.

These initiatives have helped in major reduction of both liquid as well as solid waste generation which in turn reduces the need for fresh material.

A good example shown by one of the plants in terms of re-use of waste is brick manufacturing from ash. Incinerator ash was earlier disposed of from the plant at

land filling sites as per the consent of pollution control boards. After putting up the brick manufacturing facility in the plant, all the ash is now being converted into bricks which are used in-house for civil work.

At a company level ash disposal has reduced from over 377 T in 2000–01 to 89 T in 2002–03.

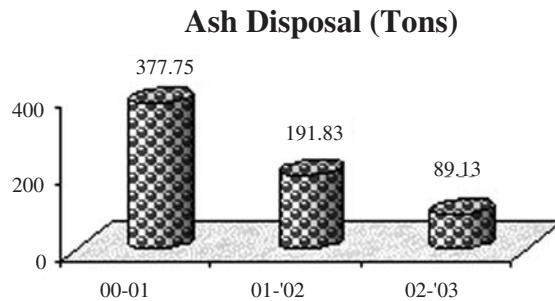


Figure 8.7 Reduction in ash disposal

Waste solvent disposal was reduced by reuse and recycle initiative, from 380 kl to approximately 57 kl.

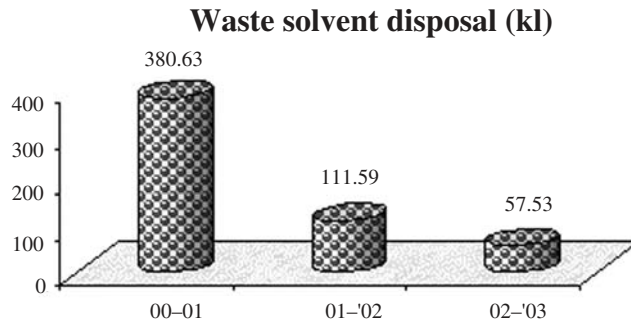


Figure 8.8 Reduction in water solvent disposal

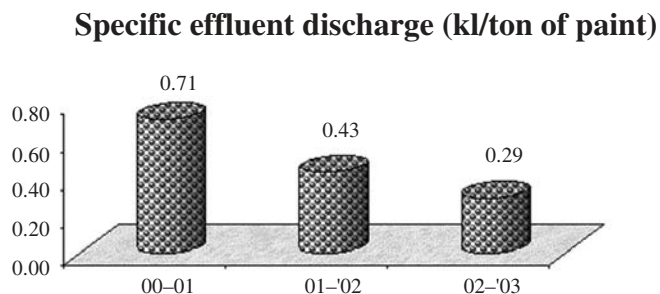


Figure 8.9 Reduction in specific effluent discharge

C) End-of-the-pipe treatment

In order to achieve 'zero effluent disposal' at the plants, effluent treatment facilities have been improved upon along with stringent monitoring of input and output parameters. Steps such as installation of block level collection pits to monitor the hydraulic and organic load, institution of equalization tank pre-formulating scheme to ensure threshold organic content at ETP inlet, etc. have ensured reduction in discharge from the plants.

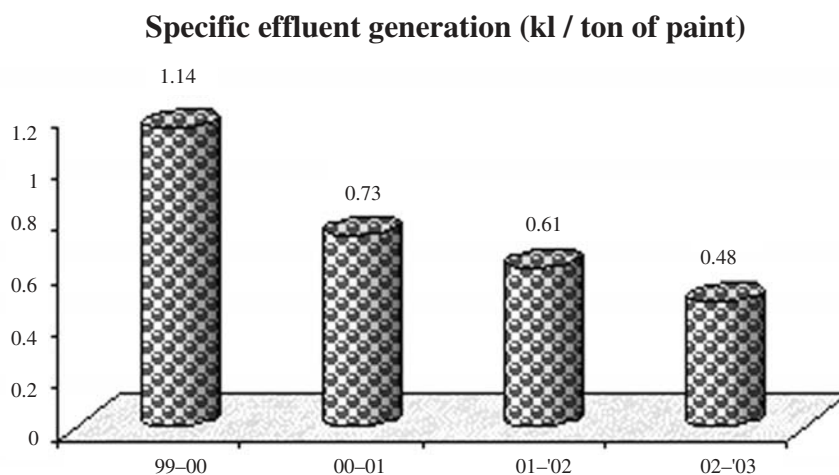


Figure 8.10 Reduction in specific effluent generation

While the quality of treated effluent is within the norms of pollution control boards, the efforts are put in lowering the levels of pollutants still further each year.

D) Natural Resource Conservation

For paint industry, precious natural resources are water, power and fuel. Plants have been taking specific steps to conserve these resources.

Initiatives such as mapping of water distribution network and identifying water consumption reduction opportunities, daily water reconciliation system across the plant, etc. have helped in focussing on drawing up action plans directed towards conservation.

Implementation of rain water-harvesting scheme—a breakthrough initiative to limit fresh water usage during monsoon. There has been a significant reduction in the requirement of fresh water.

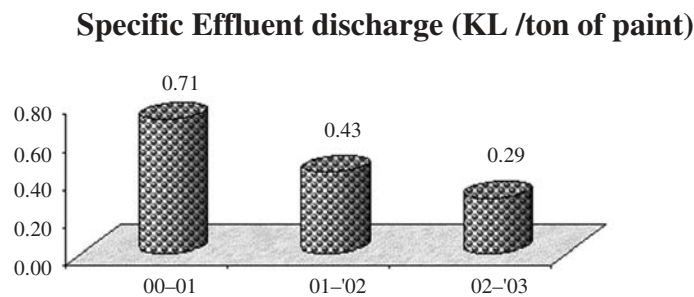


Figure 8.11 Reduction in specific effluent discharge

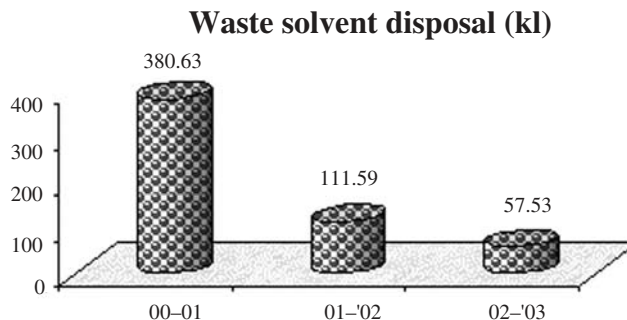


Figure 8.12 Reduction in water solvent disposal

Energy conservation (power and fuel) also forms a part of key initiatives taken by the plant each year.

Rigorous tracking and monitoring systems have enabled in bringing focus in the daily operations. Initiatives such as overall asset effectiveness, first pass yield, etc. have reduced the process losses, thereby reducing the power and fuel requirement.

Breakthrough engineering solutions such as conversion of generator sets from HSD-based to LDO-based, modifications made to power intensive areas like ETP, incinerator cold storage areas, etc. have significantly reduced the power and fuel consumption.

PILLAR THREE: SAFETY AT ASIAN PAINTS

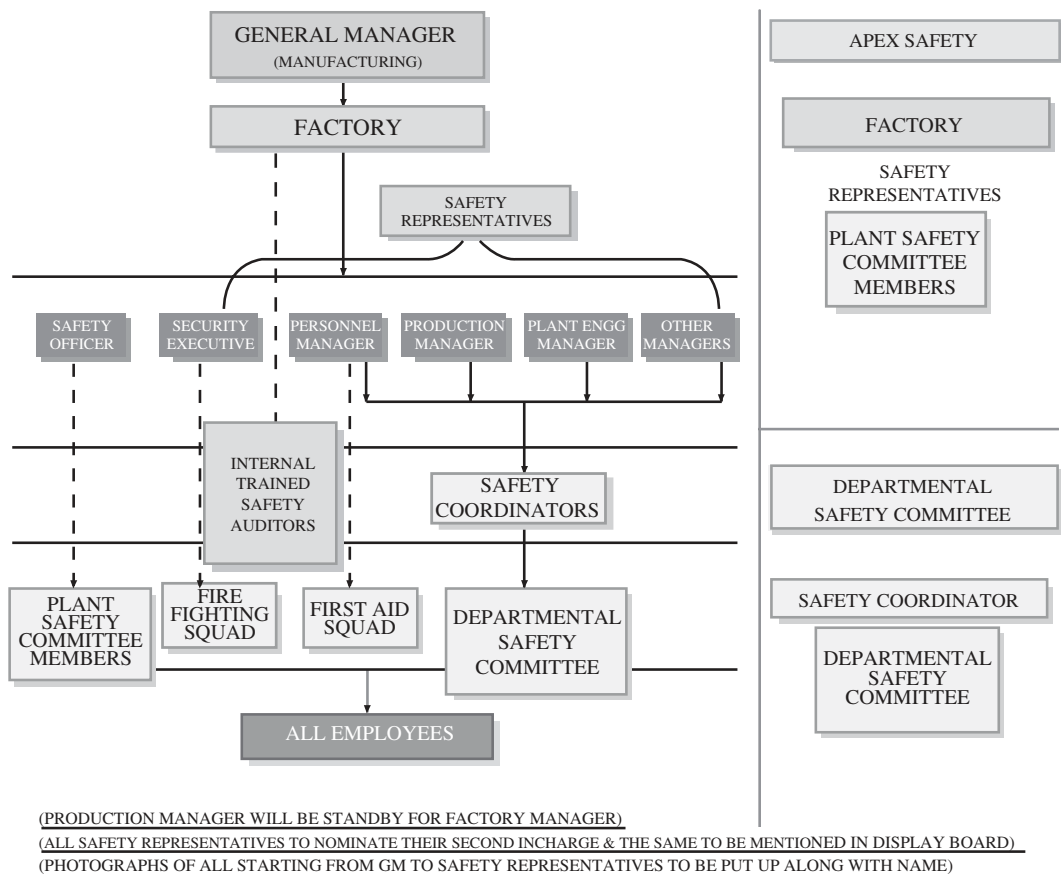
Asian Paints by virtue of its operations falls under the 'hazardous process' Industry as per Section 2 (c,b) of the Factories Act 1948. Handling manufacturing operations, while ensuring safety of men, material and machines is possible only through a focused approach and by concerted efforts from all employees, whether employed on line operations or at the senior managerial positions.

Asian Paints believes that organizations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety and by the confidence in the efficacy of preventive measures. A good safety culture is an organizational culture in which the dominating value is safety. Safety is placed at the motivational centre of the organization. The operational effectiveness of any manufacturing facility is enhanced if the shop floor is a safe place to work at, thereby allowing the front line people to channelize their energies on processes, equipment health, etc. Direct impact of such a congenial workplace is upon the reliability of processes, an enthusiastic work force, with a high level of energy.

At Asian Paints, in 1999, a study was conducted at all locations to gauge the health of the safety systems. Based on the findings, a detailed action plan to upgrade the safety standards over a period of the next five years was conceptualized. The concept of "Migration To World Class Standards" infused a lot of energy in the safety teams of the plants.

Migration plans are aimed at not only improving upon the existing safety systems but also the technical upgradations to improve safety and other parameters of successful manufacturing operation.

The safety structure at AP



In year 2002, all the four manufacturing plants of the company started their preparation to adopt the British Safety Council standards. A systematic approach of preparing a safety manual as per the BSC requirements was taken up in the first phase followed with a detailed gap analysis with reference to the existing system. An inter-plant competition in 2002–03 enabled to assess the organization's preparedness.

The organization has systematically worked upon the guidelines of BSC. The spirit has been to focus upon taking preventive measures and making operations mistakeproof.

The safety organization describes the safety policy and commitment of the management to the implementation of the policy and arrangements.

The benefits reaped from the initiatives mentioned above are the reduction in the number of reportable accidents.

PILLAR FOUR: HUMAN RESOURCES AT ASIAN PAINTS

Human resource is undoubtedly the key factor in ensuring reliable operations. Though technology, automation, systems can improve the reliability factor, all these aspects would not be effective if the employees working on them are not competent!

In the recent past, as APIL embraced the philosophy of becoming a world-class manufacturing facility, gradually it got translated into many change initiatives. Such as:

- Introduction of state-of-the-art technology, automation in core operations as well as in storage, EHS facilities aiming at reliable, safer and high-quality outputs.
- Introduction of cultural initiatives such as 5S, TPM, RCA aiming at improving effectiveness of operations.
- Redefining the existing performance parameters, e.g. goal for quality was redefined as 'zero defect' with 'right first time' and 'continuous improvements' as underlying philosophy.

Clearly, there was a radical change in the approach. The implications of these change initiatives were manifold that cut across the hierarchy. There was a significant shift from an erstwhile 'volume-driven' organization to the one in which all the above changes are implemented with reliable delivery of volumes.

This called for a hitherto unparalleled change in the mindset of employees at all levels, akin to a transformational change in the company culture. The leaders

analyzed the present organizational structure and re-examined its effectiveness with the changing work environment, which meant creating a participative work environment that is an essential prerequisite for success of cultural initiatives. Roles were redefined, and employees at the lower levels were empowered and made responsible for addressing all aspects of operations. To facilitate this, the performance management system was modified to include more stretch, with rewards being linked to deliverables on the changed expectations. A natural requirement for the above performance paradigm to be a success was upgradation of skills and knowledge levels of employees which were taken up very strongly.

Given below is the summary of initiatives that were undertaken in the last few years to address these imperatives.

Workmen

Asian Paints followed a productivity-based model for workmen. Activities performed by workmen were measured, quantified and converted into norms/outputs. Such norms along with necessary work practices then were negotiated with the recognized union. These norms and work practices form a distinguishing feature of the wage settlement in which wages are paid to workmen as per their performance against these standard outputs. This arrangement provided tremendous uniformity and hence reliability to operations.

However, the assumptions of this model got challenged by introduction of the new philosophy. It was observed that this model does not encourage the workmen to use their cognitive abilities, focuses excessively on manpower productivity rather than on asset effectiveness and does not promote empowerment.

Hence, through cultural interventions and settlements, suitable changes were introduced in various areas. The roles of workmen were modified to address restrictive work practices, improve asset effectiveness and reward right first time (RFT) behaviour. Workmen were encouraged to participate in the change initiatives such as 5S, TPM, quality improvements. Suitable reward mechanisms (monetary as well as non-monetary) were designed to recognize contributions of workmen involved. They were also empowered to take up higher order roles such as coordination of change initiatives of the section. Suitable deterrents were

introduced to combat inefficiency and absenteeism that affected the reliability of operations.

Staff

Multiprong approach was adopted here. All aspects of human resource management were looked at and then suitably modified. Here are a few of such areas:

- Competent manpower is a key for reliable operations. Sources of staff recruitment were examined. Campuses were evaluated based on select criteria and only few campuses were shortlisted to ensure high quality of recruits.
- Roles of employees were redefined. Jobs were enriched by giving higher order roles to staff. Peer leadership was consciously encouraged. Now select staff members lead the change initiatives of the department/section. Also, the roles now include performance against all other aspects of operations apart from service.
- Suitable training programmes, awareness sessions held to enhance the knowledge and skills of staff pertaining to the change initiatives.
- Cross-functional teams were formed to implement change initiatives in the plant.
- Performance management systems and reward mechanisms were suitably modified. Apart from performance in the routine aspects of his role, emphasis is given on employee's contribution to change initiatives and his 'value-add' during the year. The PFMS was made more effective, i.e. today it clearly distinguishes the best from the rest.
- Communication channels were revamped. Along with an exclusive newsletter for staff, a sophisticated intranet was launched. Department heads were asked to hold regular meetings with their staff to adequately communicate to them on department performance and progress on change initiatives. Software was developed to record and share the improvements made by different plants.
- As part of improving employee participation in change initiatives, interplant competitions were held. This included a series of presentations by the team

of staff pioneering the change initiatives to the top management, followed by rewarding the team that performed well and then celebrating the successes. This helped create a homogenous and enthusiastic work environment.

PILLAR FIVE: VENDOR RELIABILITY

This is another area where Asian Paints wants to become strong at. A lot of efforts are being made to improve the quality of vendors so that they give the desired output everytime. This part has not been included in this case study, because though important, it is beyond the scope of this chapter.

CONCLUSION

Reliability is the heart and soul of supply chain, summarizes Jaisinghani. The 'R' factor forms the core of supply chain and has to be taken care of before embarking on any ambitious plans of implementing the enablers. The advantages are straight savings and thus a serious contribution to the bottomline.

(With inputs from Mr Vikram Jaisinghani and support from Mr Jason D'souza.)

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Information Technology for Supply Chain Management

The growth and development of information technology symbolizes man's attempt to achieve finesse and skill in whatever he wants to do—from teaching children to landing on moon.

— Anonymous.

From the abacus invented by the Sumerians in Mesopotamia to Napier's bones to Charles Babbage's difference engine to the Pentium processor, the journey of the computer in particular and information technology on the whole has been phenomenal. Computer hardware and software have ruled every aspect of our life for several years. From the packet switching technology to the Internet to networking (which provides two computers to share data and software with each other). It has come a long way. From a basic Graham Bell's telephone that allowed two distant people to speak with each other to a technology that allows two computers to talk with each other, communication technology also has come a long way. A need was then felt to merge the three technologies to harness the speed and power of the computer, of networking technology to link the various computers and communication technology to be able to send messages to each other using a telephone network. The next stage was to apply this technological breakthrough so as to assist in performing everyday business-related functions in the best possible manner.

Simultaneously, the theory and practice of SCM was also evolving. The evolution of SCM can be traced to logistics strategies though its origins are still unclear. The basis of the term supply chain lies in the likely and potential benefits that can emerge from integrating the internal business functions of purchasing, manufacturing, sales and distribution. The benefits talked of then included having more control on the entire operation by being able to monitor each aspect of the supply chain. The interest in SCM grew when the strategic approach to logistics management moved from an *internal focus* that emphasized the internal functional integration of various activities/departments (e.g. production and marketing) to the overall company strategic focus, to an *external focus* that integrates outside organizations such as suppliers and distributors. This evolution of logistics management does not only involve the coordinated management of material and information flow throughout the organization, it also first introduced the importance of information flow across the channel and partnership among channel members. Companies that adopted SCM into their operations strategies obtained mixed blessings. On the positive side were the improved communication, long-term relationships with suppliers, better flow of goods and information, reduced time span in the channel, and more grasp on strategic issues. While the downside of SCM is sometimes in the form of adversarial relations between suppliers and purchasers along the channel. Among the factors that intensified the benefits and the negative results of SCM is the interplay that information systems brought about into the supply chain.

The definition of SCM includes information flow as one of the two major flow components of the supply chain. The need to share information across the various entities along the supply chain is definitely of paramount importance. In fact, information serves as the connection between the supply chain's various stages, allowing them to coordinate their actions and bring about many of the benefits of maximizing total supply chain profitability. Several people have attempted to study the importance of information in supply chain and the potential benefits thereof and the impact and problems arising due to lack of information. Research in Bull Whip Effect is one such effort.

BULL WHIP EFFECT

The objective of SCM is to provide a high velocity flow of high quality, relevant information that will enable suppliers to provide an uninterrupted and precisely

timed flow of materials to customers. However, this might not happen always. Information in the supply chain has to pass through several links before it is used and this makes it extremely vulnerable to distortions. There could be several reasons behind these such as unplanned demand oscillations, including those caused by stock-outs, in the supply chain execution process, misinterpreting demand upside as a trend, forecasting for each link separately, lack of communication between manufacturing and marketing and sales, or simply the fact that exact and accurate information might not be available at the appropriate time, etc. All of these either individually or as a combination can cause havoc and subsequent supply chain distortions. This phenomenon is known as the “Bull Whip Effect”, named for the variations in reaction down the length of a whip after it is cracked.

The “Bull Whip Effect” has been in existence for several years and has been accepted as normal in the past and, in fact, thought to be an inevitable part of the order-to-delivery cycle. However, the problems and the negative effect it had on business performance was so huge that companies started taking it more seriously. Either companies started producing more than required, or the production was far below what was required by the sales and marketing. Either way everybody suffered. The company suffered by having inventory related costs in case of higher production or problems arising due to inability to service the customer and subsequently losing him for lack of stock. Some of the examples of bull whip effect are:

- 1) Babies consume diapers at a relatively steady rate and hence the number of diapers sold every month should not vary much. But several years ago, Procter & Gamble, which manufactures Pampers, studied its diaper sales to retailers and, despite the steady rate of demand among babies, found puzzling, dramatic fluctuations in retailers’ orders to wholesalers. Even wilder were the fluctuations in orders that P&G was receiving from the wholesalers.
- 2) Volvo, the famous Swedish car maker once had an extremely popular green Volvo as its flagship product. However, with time the demand declined but the inventory with the company was huge. In order to get rid of this excess inventory the sales team devised a promotional campaign that offered heavy discounts for green cars. The campaign succeeded and customers started buying the green Volvo. Manufacturing

team without understanding the real reason behind this interpreted it as increased demand and decided to produce more green cars.

INFORMATION INTEGRATION IN SUPPLY CHAIN

As supply chain networks evolve and mature, managing their performance requires an increasing commitment to information and collaboration. That is, the organization needs to be connected and become able to share information in real time and instantaneously. This is not achievable without information technology and the tools it offers for organizationwide collaboration. In the following paragraphs an attempt has been made to describe such tools that have contributed to the evolution of SCM.

For information to flow smoothly within the organization functional integration was essential. Up to as late as late '80s this was a serious problem. Companies were facing an inter-functional rivalry and the blame game was at its peak where marketing was at loggerheads with manufacturing who in turn blamed purchasing and materials management for all its problem. The various functions also hesitated to share information with each other and often hid vital facts. Business process reengineering (BPR) was the first step towards achieving an organizationwide integration. To achieve technological integration it was essential to have integration on a mental and psychological level. BPR did just that.

BUSINESS PROCESS REENGINEERING (BPR)

Michael Hammer defines BPR in his book *Reengineering the Corporation* as: *Fundamental rethinking and radical redesign of business processes to bring about dramatic improvements in performance.*

BPR realigns business processes along more strategic lines by examining current processes and redesigning those processes to increase efficiency and effectiveness. Factors driving a BPR project can include improving customer service, streamlining processes to cut costs, or addressing inefficiencies in other high impact areas. This requires large scale integration of internal processes so that information flows seamlessly.

Realignment of all the functions within the organization made it possible to look at the organization in totality and have data and information pass through it

without any hurdles or obstacles. Information technology with its tools and technologies was able to provide the necessary backbone infrastructure to support the realignment and hence the smooth data flow. Enterprise resource planning (ERP) with its ability to combine all the operations within the firm thereby allowing companies to view the information, cash and material flow as it happens.

ENTERPRISE RESOURCE PLANNING

ERP is a software system that aims to serve as a backbone for the whole business. It integrates key business and management processes to provide an integrated view of the entire organization and the activities that take place within the organization. ERP tracks company financials, human resources data and all the manufacturing related information such as inventory data and its spread, production schedule, and all that is required to assist in manufacturing related activities. The management of processes allows for the integration of functional departmental data and applications allowing for better decision-making and planning. ERP systems have emerged to automate business functions and offer an integrated data solution across an organization's infrastructure. They provide the capability to manage and integrate the information and services of departments throughout an entire enterprise. This allows organizations to better manage all their resources, thus achieving cost reduction and efficiency through the integration of all information among various business processes.

Historically, the origin of ERP systems can be traced back to the '60s, when the focus of organizational information systems was mainly on handling traditional inventories. In the '70s, the systems focused on material requirements planning (MRP). These systems helped to translate master production schedules into the planning of raw material requirements. In the '80s came the concept of MRP-II, which involved optimizing an entire plant's production processes. Future evolutions included the management of other areas such as finance, human resource, engineering and project management. New technological advances facilitated the development of software systems to manage functional units. Currently, various ERP systems are available, including Baan, JD Edwards, Oracle, PeopleSoft, and SAP. ERP systems emerged from a smooth, regular and steady progression that can be traced from the '60s to a high point in the mid-'90s, with major success stories across the world. This progressive evolution—which embraced basic inventory

systems, MRP, MRP-II and MRP-II extensions—has lead to a trustable and well-known product in the industry, with high credibility, a good position in the market, and a strong advantage over competitive systems. The cycle, which includes three phases—in the '70s, '80s, and '90s—has certainly generated confusion among managers and end users and provoked a certain reluctance to adopt workflow systems.

ELECTRONIC DATA INTERCHANGE

Electronic data interchange (EDI) is the computer-to-computer exchange of business data in standard formats. In EDI, information is organized according to a specified format set by both parties, allowing a “hands-off” computer transaction that requires no human intervention or rekeying at either end. Organizations have adopted EDI for the same reasons they have embraced much of today’s modern technology-enhanced efficiency and increased profits. Benefits of EDI include:

- Reduced cycle time.
- Better inventory management.
- Increased productivity.
- Reduced costs.
- Improved accuracy.
- Improved business relationships.
- Enhanced customer service.
- Increased sales.
- Minimized paper use and storage.
- Increased cash flow.

EDI standards are developed and maintained by the accredited standards committee (ASC) X12. The standards are designed to work across industry and company boundaries.

Industries currently using EDI include retail, insurance, education, entertainment, mortgage banking and numerous departments of the US Government.

EDI permits hundreds of unrelated companies to communicate and process business transactions electronically.

EDI works because it relies on a standard system that everyone can use, developed under the guidelines of the American National Standards Institute (ANSI), the coordinator for national standards in the United States.

The ANSI committee ensures that everyone using a process such as EDI follows the same rules and methods, making the programme universally accessible. As a result of the standard, all businesses share a common interchange language, which minimizes the need for users to reprogramme their internal data processing systems.

PROBLEMS WITH EDI

—Interoperability issues with VANs.

—Proprietary communication.

Traditional EDI involves the translation of the transaction file produced by an application programs into a specialized EDI “Language” before transmission to the trading partner and translation back to an application file before processing.

The justification of a specialized EDI language (EDIFACT, X12, etc.), if ever there was one, has been obsolete for decades. Second generation EDI bypasses the translation to this specialized EDI language and transaction files are transmitted in their raw state as they were generated by an application program.

The result is the actual transaction data that is moved between the application programs is dependent on the functionality of the business process implemented by the application program which generates the transaction file. The transaction file is tailored specifically to the actual data that is generated by the business process rather than an all-embracing proprietary implementation of a fixed structure used by traditional EDI which totally ignores the business process.

Before being processed, the transaction file is reformatted to that required by the processing application program at the receiving end of the transaction.

By removing the translation of transaction files to a specialised EDI language, most of the complexity, cost and inefficiencies of the old EDI approach are eliminated.

INTERNET

Internet has had a profound impact on SCM. The backbone of SCM is communication and real time information exchange between various parties involved in the production and distribution of materials. According to a survey, of the various areas of SCM, transportation was the most popular decision area followed by order processing, purchasing and procurement, relation with vendors, customer service, inventory management and production scheduling.

The following is a list of various activities in SCM that have created new Internet opportunities:

- Online vendor catalogue (without human contact).
- The ability to contact vendors or buyers.
- The ability to schedule outbound shipments.
- Provide worldwide customer service (24 × 7).
- Receive orders from all over the world all the time.
- Check the status of orders.
- Place bids on projects.
- Notify vendors of changes in configuration in products.
- Pay invoices electronically.
- Track equipment location.

- The ability to directly communicate.
- The ability to schedule pickups and deliveries.
- The ability to be more responsive to customer service problems.
- The ability to reduce service costs and response time.

E-COMMERCE

E-commerce is a value delivery mechanism that combines the electronic exchange of goods (products, services) with support functions (banking, insurance, etc.). Though e-commerce has been in existence for several years in the form of EDI, VPN, etc. Internet has brought a boom to e-commerce. Benefits of using e-commerce in SCM are immense from achieving a reduction in supply chain costs (distribution and order handling costs), improvement in customer service and increase of shareholder value. To capture the above benefits, organizations might have to radically restructure their supply chains and reconsider their whole business life cycle—from strategy to implementation. In order to understand the applications of e-commerce on SCM, it needs to be viewed from two dimensions—Business to consumer and business to business. E-commerce technologies, particularly the WWW technologies enable an organization to create virtual shop fronts that are directly accessible by global customers. These can be either a simple advertisement that talks about the products and other specialties to a proper trading and transaction processing site. The introduction of e-commerce in the business to consumer flow can have an upstream effect in a supply chain.

E-COMMERCE FACILITATES

- Efficiency: Evaluation of end-to-end trading cycles, e.g. evaluation and possible re-engineering of trading cycles leading to reduced cycle times.
- New functionality such as on-line bidding in e-auctions and e-requests for quotations (RFQs).
- Use of more efficient and cheaper connectivity methods such as the Internet and XML (a computer language for coding content and delivery).

- Connectivity to external supply chains, e.g. extranets, EDI, e-hubs, e-marketplaces—allowing shared real time information such as suppliers accessing real time sales.
- Content management, e.g. private catalogues, public catalogues, internal inventory management, maintenance management, MRP systems.
- Payment systems, e.g. purchasing cards.
- Multimedia (although e-procurement does not necessarily contain multimedia elements).
- Improvements in localized supply chain mechanisms, consortia, etc. leading to mutual benefits.
- Compliance—improved workflow of the internal procurement process enabling end user self-service and decentralization with centralized control through company specific catalogues.
- Increased reach to new suppliers and markets.
- Connectivity to external sources of information, e.g. Portals, e-hubs, e-marketplaces.
- Sourcing, e.g. identifying new sources via the internet, use of intelligent search engines.

E-commerce implementation has the capacity to change the dynamics of the purchasing and supply management profession, as, for example, there will be a greater emphasis on knowledge management. E-commerce has the ability to change the culture of the purchasing and supply management in an organization and may lead to a greater emphasis on cost and prices. E-commerce will also facilitate purchasing from global sources. Implementing e-commerce will release time to be spent on more value-added aspects of purchasing such as the development of suppliers. It is an opportunity to deploy competencies to the greatest effect. E-commerce can enhance transactional purchasing by providing end users with quick and easy-to-use electronic systems such as electronic catalogues for selecting and purchasing their requirements from preferred suppliers. This should reduce

transactional costs by improving speed and efficiency and provide greater commitment to contracts by route reduction of maverick purchasing, i.e. purchases made outside an organization's contractual arrangements. Engaging in e-commerce processes can bring potential benefits to suppliers provided they have been thought out correctly. These include:

- Improved management information.
- Time savings in re-input of orders.
- Reduction in errors, e.g. from re-inputting returns, deliveries.
- Reduced transaction costs and cycle times.
- Holding less stock as a result of more efficient (i.e. real time) communications with customers.
- Sales data, information for use in forecasting improved supplier performance by sharing.
- Supplier measurement information.
- Faster payment.

NEED FOR CONCISE AND EXHAUSTIVE SOFTWARE

The various processes within and around the enterprise are governed by information. The entire process of supply chain is triggered by information from the sales team. For example, sales programmes create the numbers for material requirements. Additional MRP runs then convert the numbers into planning data, which is then combined with actual order data as a production order. The results of requirements determination are sent to vendors as short-term calls, which trigger more MRP runs at the vendor's site for the basic materials needed. This complicated, successive flow of information can lead to a bullwhip effect at many locations: the effects of see-sawing, delays and buffering produce unnecessary added effort, long throughput times and high inventories. The need to re-key and re-input the information at various points can only intensify these effects. Hence there

is a need to have a single software system that can allow various and different players within the supply chain to use the same data, add value, process it according to their needs and requirements and send it to the next point accordingly.

SCM software systems have the technology to perform online transactions, such as posting orders or dealing with supply questions, in fractions of a second. Accordingly, companies want to create accessible, comprehensive, efficient, and flexible processes in their supply chains so that they can avoid production shortfalls or excessive inventory. Studies show that the primary benefits of SCM and hence SCM software (the two cannot be discussed in isolation) include greater transparency in the logistics chain, improved on-time delivery, reduced inventories and shorter throughput and delivery times.

Each company has different requirements and expectations from SCM and hence SCM software solutions have to be customized. The SCM project must first examine how to quantify and measure the overall benefits. The advantages are many. It offers a tremendous potential for saving, up to the level of double digits. It can measurably limit the bullwhip effect and its accompanying added effort, etc.

SCM SOFTWARE

SCM works only when the various systems in a company are linked with each other. Integration of various applications is the backbone of SCM software and the better the integration more effective the supply chain. Most companies that work with SCM have already invested in ERP and have resolved the problem of integration within the enterprise. However, SCM architecture requires its own level of cross-company planning and control functions. Interfaces are needed to enable the SCM solution to access and provide data to material masters, order numbers and BOMs. Since the SCM data in a supply chain resides in several different basic systems, it is essential to carefully examine the ability of a software package to be integrated with existing systems.

The greatest advantage of SCM software is to be able to execute and evaluate decisions in real time. For example, in a situation where an SCM manager has to fix a delivery date online: The task simultaneously triggers functions for availability

and capacity checks across several levels of the supply chain. It is especially important that users can perform 'what-if' scenarios and evaluate the effects of changes. This requires methods and algorithms for simultaneous planning and control of supply chains. SCM software in most cases provides these features.

SCM demands an intensive, interdisciplinary and cross-company project whose success primarily depends upon the mutual trust of the partners involved. The companies participating in the project must be flexible enough to create a situation from which they can all profit. A project also requires internal and cross-company optimization and collaboration, along with an analysis, design and optimization of inter-related business processes. Before deciding to implement SCM software it is essential to examine the ease with which the SCM software can be integrated into existing systems and also how well you can adapt the company's business processes to the SCM solution.

CONCLUSION

SCM and IT are inseparable and incomplete without one another. IT, Internet and its tools have enabled supply chain to prosper and become an aid to the SCM manager. In this chapter several IT tools have been discussed and described. All of them in combination with each other provide an ability to the supply chain manager to take informed decisions in real time.

ANNEXURE

Emerging Technologies of Electronic Commerce and Its Impact on Supply Chain Management

“May you live in interesting times.”

— A Chinese proverb.

ABSTRACT

Internet has revolutionized many aspects of our life. It has brought the world closer by its ubiquitous application of e-mail. Electronic commerce (EC), another of Internet's killer applications has also influenced us tremendously. Whether it is buying products for self-use or for the organization, EC is just about everywhere. And if you think this is awesome, there is more to come. This annexure looks at m-commerce and how it is bound to impact us in whatever we do. It also looks at u-commerce, which is where e-commerce, and m-commerce are likely to move in times to come. Some other interesting trends have also been covered. An impact of these technologies and tools on SCM has been discussed.

Electronic commerce as we all know is nothing but commerce (buying and selling) conducted over the electronic medium. The Internet has had such a profound impact that in this article the only electronic channel (or medium) considered and referred will be Internet. And because of so much entwinement of EC with

Internet, obviously any advances or emerging technologies in the area of Internet are bound to impact EC. Hence in this annexure Internet, emerging trends, impact on EC and hence on business will be discussed. A lot of research work is happening in the area of EC and lots of interesting developments are likely to take place in this space.

WELCOME TO THE WORLD OF WIRELESS ECONOMY

Internet means an endless store of information at our fingertips. However these fingertips have to be near a personal computer (PC), usually set up on a work surface and connected by a telephone cord to the communications network. This hinders the *anywhere anytime* facility that the wireless devices can offer. One can be connected all the time with wireless devices. These devices will also make obtaining information more convenient than ever. The applications written especially for the wireless Internet will change the way people work, play and communicate.

Furthermore, the number of people with an access to a wireless device (mobile phone) is far greater than the number of people with an access to a PC. And this fact holds not only for India but also for the developed West including US. This makes the opportunities very exciting. It is an opportunity to reach an entirely new audience of users, including people who never have accessed information using a traditional PC.

According to an estimate, there were more devices, accessing the Internet via wireless devices in 2003. Also, almost all mobile phones sold this year incorporated wireless data access. It is also estimated that by next year very few phones sold will be without Wireless Application Protocol (WAP) capability.

This data is an eye opener and refers to what lies in future for us. We are entering the exciting phenomenon called mobile Internet. Mobile Internet is much more than just accessing Internet using the mobile devices or checking e-mails from mobile phones but it opens up new avenues for SCM, CRM, SCM, sales and all other types of professionals who require to access data/information on a regular *anytime anywhere* basis. Even short messaging service (SMS) has opened up a whole new avenue of opportunities for businesses not only to send advertising messages but also reminders and other important communication.

The Wireless Enterprise

Over the next five years, corporate users will join the consumer users in the wireless services user base. Some companies (employees) have already started using wireless technologies to connect corporate IT systems with customers on one side and suppliers and partners on the other.

With Customers

For employees engaged in the area of customer delight and retention, m-commerce (mobile commerce) is a big boon. Such people typically are mobile, who can benefit immensely from anytime and anywhere access to information. While in the field, customer care and sales professionals can use this to get an edge over competition by getting to know the minute by minute sales leads, order status tracking, availability to promise, access to marketing information, customer feedback, etc.

For Sales Professionals

M-commerce could mean easy access to the sales literature and all the information available on the product. This could mean empowering them and making them outstanding in their work.

For Suppliers

A small-time supplier may or may not have an access to a PC and Internet but he definitely will have a mobile phone. Hence m-commerce will be able to achieve complete integration while connecting even small suppliers who are not technology/Internet savvy. For others, the *anywhere anytime* feature will provide a lot of additional benefits.

For Maintenance Professionals

M-commerce can also provide most current information about frequent problems with equipments. In some cases the wireless device may even be used for calling

into the failing component remotely for additional diagnostic tests. This information helps the professional to diagnose the problem remotely and have the right parts in hand when arriving on the premises. These mobile systems also integrate with inventory systems so spare parts are arranged easily and logistics arranged for pick-up and delivery. In addition, frequently asked questions can be provided along with chat facility to discuss the problem with peers and potentially save time.

For Inventory Management Professionals

For physically checking inventory, radio frequency was used, where a hand held device (radio data terminal—RDT) with bar code reader could be taken around the warehouse and the data picked up by the RDT and transferred to the central computer via radio waves. But the limitations were too many and hence did not gain as much popularity as it should have. Wireless communication and mobile Internet can come in handy for all these inventory management professionals. It is easy to use, economical and does not have the limitations of the RDTs. It will be easier to check inventory and adopt inventory management practices.

For Logistics Professional

Shipment tracking is one of the most useful applications of wireless devices. United Parcel Services (UPS) has recently begun to use wireless devices to track shipments. In February 2001, *Computer World* reported the cost to UPS of each Field employee query to access CRM data via wireless connections as \$0.10. The cost for the same inquiry by telephone was \$2.50 per call. Drivers use the system and UPS customers can determine the estimated delivery time of their packages with a mobile phone.

For Insurance Professionals

Insurance field workers can collect data and process claims on the spot, accelerating approval and premium collections.

For Finance Professionals

Banks will be able to reach all the customers and not just the Internet savvy ones and vice versa, i.e. all the customers will be able to get all types of information from the bank simply by pressing some buttons on their mobile phones. Brokerages stand to benefit the most. Active traders can access the stock market information from anywhere and indulge in transactions. For customers using wireless devices, the advantages are manifold.

- Personalized alerts: Users can respond to changes in their account status and market conditions wherever they are after receiving electronic alerts either when their account balance goes below a threshold level or when a stock hits a pre-determined target. Citibank in Poland provides the customers with daily bank balance updates via SMS messaging.
- Instant bill payment: Citibank has announced plans for what it calls an actionable alert system that combines its wireless bill payment system with its alert system. For example, customers would first receive a message on their mobile phones indicating the due date of the impending bill and then be asked whether they would like to pay it right away and if the customer clicked yes the bill would be paid automatically without the customer even having to log onto the bank system. A wireless person-to-person payment is already available for customers of Citibank in Europe.
- Instant funds transfer: Many companies are offering facilities to their wireless customers the ability to transfer money between accounts.
- Aggregation: Customers are able to access their entire financial portfolio across several institutions at once, a feature that might be useful when they are away from a PC.

Decision Makers

With so much information available, the process of decision making will become simpler and easier. Once again, the anywhere anytime feature can make the whole process faster.

E-businesses

For e-tailers ‘mobile devices provide an unprecedented opportunity to detect the moment when a potential customer is in the right frame of mind to buy.’

As wireless technology improves, consumers will use hand held devices to shop for a range of goods and services, and e-businesses can profit by providing user-friendly devices and targeted services that lend themselves to wireless shopping.

Wireless technology will enable e-commerce to ‘reshape whole industries’ as people stay connected around the clock through mobile computers; embedded sensors and other devices that can all communicate with each other.

“Wireless will be bigger and more important than anyone imagines,” says an Accenture report.

U-Commerce (Ubiquitous Commerce)—the next dawn

E-commerce and m-commerce will evolve into “u-commerce ... a world where economic activity is ubiquitous, unbounded by the traditional definitions of commerce, and universal.” To quote John Beck, director of research at Accenture Institute for Strategic Change “We believe it is in the always-on world of u-commerce that the real value of the ‘e’ and ‘m’ will be realized. “U-commerce is not a replacement for anything companies are doing today, but an extension of it. And it will be mandatory, not optional.”

The Accenture study predicts the worldwide market for wireless, Internet-ready devices will soar 630 per cent by 2005. In the United States, mobile devices will account for US\$20 billion in e-commerce transactions.

“For those able to leverage the unique quality of these devices and tailor services and products that tap into the customer’s location, context and personal preferences, the opportunity is staggering,” the report said.

For e-tailers (e-commerce retailers), the report said, “mobile devices provide an unprecedented opportunity to detect the moment when a potential customer is in the right frame of mind to buy—and reach the customer with an appropriate, and welcome, message.”

Since mobile devices can show where a customer is at any given moment, they lend themselves to very targeted marketing, the study pointed out. Wireless devices can also be turned into 'electronic wallets' that allow consumers to make 'cash' or credit purchases in local or foreign currencies.

The Accenture study was based on the results of an online survey of 3562 mobile-device owners in the United States, the United Kingdom, Japan, Finland and Germany, and on interviews with companies working on wireless data communications.

Use of 3D technology to display products on e-tailing sites

One of the potential and greatest benefits is that it helps get a higher surfer-to-buyer conversion rate.

The biggest problem faced by B2C EC sites is that the hits do not get converted into actual buys. The customers are wary of an online order because they are not sure of a product's size, colour or overall look.

According to research by the Yankee Group, 81 per cent of online consumers who use the Internet to research products, but do not actually purchase them, say the fact that they cannot judge the quality of the merchandise online is often what stops them from buying.

Hence if e-shoppers have the ability to rotate and view a product image online, as well as the ability to zoom in close on product features, it cannot only enhance customer shopping experiences but also improve sales.

Such 3D technology offers many potential benefits, including increased consumer time spent on a site and to higher surfer-to-buyer conversion rates.

So far, early test results from several major e-tailers indicate that using 3D visuals can have a dramatic impact on online sales.

Some of the most impressive numbers come from an e-mail test run on Mother's Day by Gifts.com, an e-tail site backed by *Readers Digest*. The site found that the conversion rate among 50,000 consumers who viewed a Mother's Day

pendant through a RichFX 3D video presentation was approximately seven times higher than among the 50,000 shoppers who viewed only the 2D version of the pendant.

In addition, Gifts.com showed a return on investment of US\$2.77 for every dollar spent during the promotion, according to Gifts.com vice-president Dan McManus.

Other companies, including Nike and Eddie Bauer, have experienced similar positive results with 3D and zoom technology on their site. Sales of Eddie Bauer's Daypack backpack collection saw a 25 per cent increase when the product was featured online through Viewpoint's 3D technology during last year's back-to-school season.

Customers could interact with the bags online in a number of ways, such as virtually turning them over, zooming in and out, and even detaching their parts.

An attempt has been made to cover the applications/trends that impact EC directly, however there are some other trends, which may do so indirectly.

'Mobile Data Wireless Display' is one such device that weighs less than 2 pounds and is designed by Panasonic. The product is designed to let mobile users instantly input and transfer data—as well as capture and save up to 100 screen images—on a ruggedized transfective touch screen. Panasonic said the new product will deliver Windows and network-based data access and computing capabilities to a range of mobile workers, including law enforcement officers, utility and construction workers, and medical personnel, sales force, customer retention force, etc.

Another fascinating and futuristic trend comes for the field of health care management. Computers doubling as shirts will soon be able to monitor a person's vital signs on an ongoing basis—and may one day be able to administer medication. They will be in the forms of clothing, incorporating monitoring devices that can transmit vital signs to remote locations. A company called Vivo Metrics Inc. has a lightweight vest called the 'LifeShirt' that features embedded sensors that can track cardiac and respiratory signals, as well as more than 30 other physiological signs. Since the patient is not tethered to wires, he or she is free to move about and lead a relatively normal life. The device is aimed at a diverse population of

people from athletes to clinical test patients to anyone with chronic health problems, but particularly at those with heart and lung problems.

The list is endless. The research goes on and so do applications. Probably the next five years will witness a sea change in everything we do, including the way we think. We just have to wait and watch... .

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E-Purchasing for Supply Chain Management

“Electronic Procurement is a big trend that is having a big effect on us. It’s coming down the track at 100 miles per hour. Its amazing to me. I’ve been in procurement for 37 years, and I have never seen such a revolutionary change happen so fast.”

— Gene Richter, lifetime veteran of Purchasing function at IBM.

Traditionally purchasing is perceived as the ‘Cost Centre’, an activity that adds only cost burden to the company’s balance sheet, and a necessary evil. Now with bottomline growth becoming equally important as the topline growth, purchasing function has come to the fore and has become a vital activity within the firm. Purchasing cost, which consists of cost of paper work associated with purchasing, other formalities required to streamline the purchasing activity, etc. constitutes almost 30 per cent. And it has been established that a 5 per cent saving in this cost results in a whopping 30 per cent effective increase in sales growth. This has made purchasing a prime activity within the company, which has the potential to generate in-house profits through savings.

Purchasing includes all the activities that involve acquiring goods and services from suppliers, third parties from the initial concept and definition of the requirement through to the end of the service contract. It includes the functions of buying, purchasing, stores and stock control.

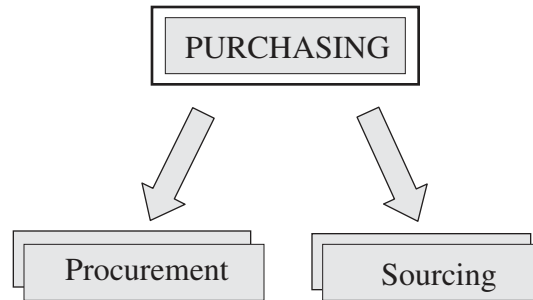


Figure 10.1 Purchasing constituents

With high technology applications and use of modern tools and techniques purchasing is evolving and turning into a saving centre—an activity where there is a tremendous opportunity of saving big money for the company by choosing the right supplier, value engineering, ordering the right quantity of material, ensuring quality at every stage, using technology tools for taking right decisions at the right moment and implementing other innovative methods such as collaborative purchasing, etc.

The overall function of purchasing and the activities it performs can be broken down into two constituents: Procurement and sourcing (refer Figure 10.1). Procurement and sourcing are often confused with each other and used interchangeably. Sourcing is a much broader concept than procurement. A good sourcing decision can do wonders to the procurement process. The goal of any sourcing initiative should be to select the mix of suppliers, products and services that best meet the organization's requirement at the lowest total cost, which is the sum of multiple parameters—including quality, delivery, payment terms and price. Making such total cost-based sourcing decisions requires organizations to develop advanced negotiation skills and a high level of product category expertise, including a deep understanding of supplier capabilities and constraints.

Sourcing involves a series of activities that start with finding and selecting the right sources of supply, supplier selection based on several criterion such as technology, product capability, process capability, management, etc., negotiation and contracting, which in turn requires collecting data on the market trends, competitors, economy, supplier, etc. analyzing the data, etc. This sets the ground for procurement to come into the picture, which involves activities such as transacting with the vendor, exchanging information such as plans, schedules.

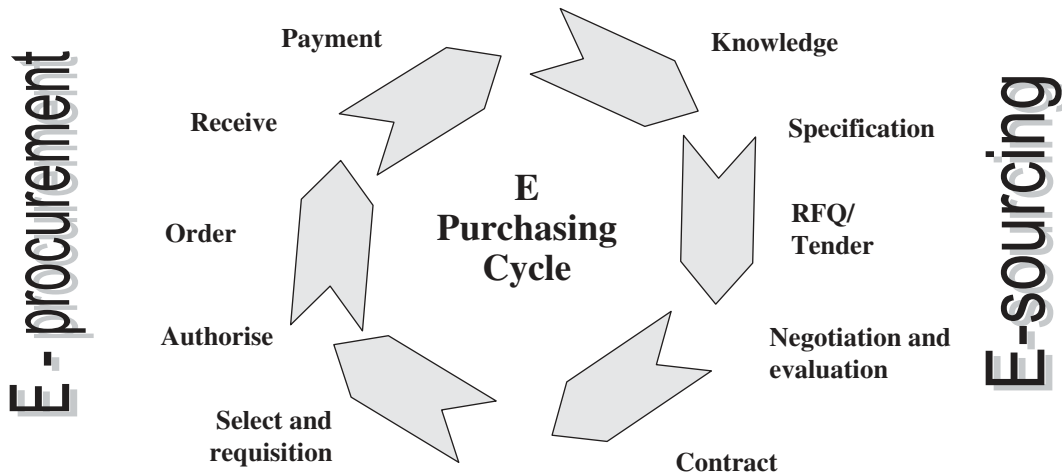


Figure 10.2 The e-purchasing cycle

E-PURCHASING

E-purchasing is a web-based requisitioning system with online catalogue and electronic approvals. It replaces paper requisitions that used to be physically walked from one department to another. E-purchasing systems provide new capabilities that offer significant operational and financial impact both internally and externally. The efficiencies of an automated system save companies money at order time and when dealing with accounts payable and receivable.

E-Purchasing Cycle (Fig. 10.2) has two parts—e-procurement and e-sourcing. E-sourcing is the reflection of the strategy of the company towards purchasing in particular and vendor or supplier management in general. E-sourcing is strategy-oriented and reflects the company's policy towards purchasing, in particular and vendor management, in general. While procurement is more transaction-oriented and involves the usage of modern tools and techniques under the guidelines set forth by sourcing.

E-SOURCING

The Chartered Institute of Purchasing & Supply (CIPS) defines e-sourcing as:

“E-sourcing is using the Internet to make DECISIONS from STRATEGIES regarding how and where services or products are obtained.”

Essentially, e-sourcing is all about gathering vital information to aid an intelligent purchasing decision. E-sourcing is a broad term and includes everything from simple electronic catalogue and online auctions to virtual buying communities by providing real time information that allows the sourcing team to get visibility on contracts and spending patterns. This has to streamline workflows, increase flexibility, and improve the accuracy and availability of information between business buyers and suppliers. This increase in information sharing allows buyers and suppliers to conduct more informed negotiations and to develop collaborative relationships with each other.

E-sourcing can create tremendous value for both the buyer and the supplier. The immediate advantage of having an apt e-sourcing program is reduction of the total costs associated with business-to-business (B2B) transactions. This benefit reflects on both the buyers' as well as the suppliers' side. Since such systems can distribute all requirements electronically, it takes out the drudgery and time required for the manual handling of data, such as requests for quotation, purchase orders, order acceptances and shipping notices, by substituting electronic communication for paper documents.

IMPLEMENTING E-SOURCING

E-sourcing requirements and problems associated with it vary from industry to industry and hence it is difficult to provide a single path or rule for implementing e-sourcing. However, the following five principles should be used to guide any company's venture into e-sourcing.

1) Waste throughout the total supply chain must be eliminated

Businesses naive to the intricacies of electronic buying will be initially tempted to engage in high levels of spot buying because they can immediately compare prices using e-sourcing. However, this has only a short-term impact on prices. Long-lasting cost savings will only be generated when e-sourcing is used to permanently eliminate inefficiencies in the buying and selling processes. E-sourcing

can also add value by accessing a broader and more efficient supply base. In addition, buyer and supplier transaction costs will be reduced because of the automation of clerical activities and through greater information sharing.

2) Product characteristics will drive the form and structure of e-sourcing.

Many manufacturers have already begun to use e-sourcing for indirect buying, such as travel and maintenance, repair and operating supplies. However, they are also hesitant to attempt similar activities for the procurement of direct materials and services because of concerns with quality and delivery reliability. Unless the e-sourcing of direct materials and services is done right the first time, the customer may be negatively affected.

In fragmented commodity markets, electronic auctions can be used to satisfy buyer requirements of lower cost and reduced order cycle time with minimal investment. However, when the market consists of highly customized products or innovative technologies, buyers and suppliers usually find it necessary to collaborate more closely. In these dynamic markets, e-sourcing via the Internet can be used to share detailed product and performance specifications, as well as link design activities together between buyers and suppliers.

3) Market exchanges should be part of e-sourcing activities

In many industries third party 'auctioneers' are used to facilitate e-sourcing of standardized products. Using a third-party expert initially allows a business to gain comfort and familiarity with electronic market exchanges without significant investment. However, use of a third-party can reduce the level of potential cost savings. For example, Deere & Company is now using a third-party market exchange to facilitate procurement of a number of its agricultural equipment parts and components and plans to greatly extend its use in the future. Eventually, Deere plans to bring its electronic auctions in-house to further reduce sourcing costs by increasing competition in its supply base.

4) Automation will drive overhead cost and order cycle time reduction

E-sourcing extends earlier cost reductions from using procurement cards and blanket purchase orders by removing the human variable in B2B transactions.

Web-based software is now widely available for supplier search, request for quotation development, automatic bid analysis and preliminary negotiation research. Companies have successfully reduced bid times from several months to several days, a dramatic improvement in order cycle and new product development time.

These electronic tools can reduce the amount of time required for a buyer to find and evaluate appropriate suppliers. From the supplier's perspective, less time is required to enter the buyer's data into its databases. Additionally, fewer mistakes are made than when transcribing information from one piece of paper to another. This frees up buyer and supplier time to seek out additional cost reductions or new customers.

5) E-sourcing activities must be completely integrated into new and existing business strategies

Since e-sourcing impacts most internal business processes, it must not be taken lightly. It affects the entire supply chain from supplier selection and development through operations and distribution. Physical flows, as well as information flows, are affected. Improved and timely information sharing can also reduce physical inventories. E-sourcing allows a business to dramatically reduce its costs and allows buyers to develop greater insight to demand flow. A company's production planning systems must be compatible with the new sources of data.

In an e-sourcing environment, it is not unusual for overall order cycle times to be reduced from days and weeks to hours because information is now available instantly all the way from the initial raw material suppliers down to the ultimate customers.

Companies seeking to implement e-commerce initiatives tend to pass through four stages of development. The first is the grassroots stage where different e-initiatives are pursued throughout the company but with minimal centralized coordination. In the focal point stage, a senior executive and a centralized e-commerce group are named, who then become responsible for setting priorities and organizing the company's e-commerce activities. In the third stage of structure and deployment, the company has formalized its e-commerce activities, choosing those with the most promise and developing them within the overall strategy of the company. The endgame stage is characterized by mature e-commerce initiatives that are deeply embedded into the structure and culture of the firm.

Although there are significant benefits for most companies in e-sourcing, they must be aware of the caveats involved and not disrupt existing supply relationships. However, businesses that do not embrace the new technologies of e-sourcing may be relegated to watching from the sidelines.

(The above information has been used with permission from Dr Jim Patterson who is an associate professor of management at the Western Illinois University Quad Cities Regional Centre in Moline. He teaches classes in supply chain management for the department of marketing and finance. This information was a part of his article titled E-sourcing trends available on the site: <http://www.wiu.edu/marketing/3sept00.html>)

E-PROCUREMENT

SAP defines e-procurement as the business-to-business purchase and sale of supplies and services over the Internet. This involves buying and selling using the ubiquitous medium of Internet. This automatically ensures that the time required for taking usual procurement decisions can be drastically reduced. E-sourcing is the foundation upon which rests the success of e-procurement. According to IDC, the major benefits of e-sourcing are its abilities to address the difficulties of strategic sourcing assessment, automate most routine tasks, provide spending and category management visibility and control, maintain sourcing history and transfer best practices into everyday purchasing operations.

Most organizations save money by adopting a purchasing strategy; e-procurement uses the Web to deliver this strategy. It cuts cost for both buyers and suppliers by automating the purchase and supply process and by reducing the one-off 'maverick' buying decision outside preferred supplier agreements. These lower costs mean a healthier bottomline (thus better customer and shareholder perception), often leading to bigger and better market opportunities.

The procurement process starts with searching for suppliers or appropriate sources. E-marketplaces or sourcing sites have become the ultimate destinations for sourcing professionals to hunt for new and able suppliers. Some of the sourcing sites such as globalsources.com or thomasregister.com have become synonymous with sourcing. Such sites are designed to streamline a company's

purchasing processes by placing and approving orders and arranging delivery thereby eliminating many paper-based procedures and labour-intensive processes.

A buyer can find likely suppliers on these sites, details on his facilities, current clientele, experience, background, etc. is also available. Buyers can also contact them through these sites in order to get more information and start the process of sourcing. Once the basic information is exchanged and suppliers are short listed, e-procurement tools can help negotiate a good and fair price for the buyer.

Use of e-procurement allows much tighter control over spending and authorization, easier transaction processing and helps avoid stockpiling of product because you always know what's available. It also allows companies to place orders for themselves or on behalf of customers at weekends or after office hours, confident that products are available and orders will be processed the next working day.

Remote access via the web to accurate inventory information can improve customer relationships, reduce purchasing overheads, streamline inventory management and improve manufacturing cycles.

TOOLS OF E-PROCUREMENT

Pricing tools such as online auctions, i.e. reverse auctions hold tremendous potential to reduce procurement costs and lower the price of goods purchased. Suppliers need only have access to a browser to participate, hence reverse auctions are small-business friendly.

By automating the procurement process, online auctions result in a reduction of paper-based processes and manual activities that were once necessary in the traditional procurement model.

The entire bidding history for an auction is captured in a report by the enabler and provides the procurement officer with valuable information that can be used as market intelligence for future auctions.

Reverse auctions promote reduced acquisition cycle time through the rapid bid and rebid and negotiation process done in real time over the Internet. With

reverse auctions agencies can receive competitive bids from suppliers in matter of minutes instead of days or weeks.

Great savings can be gained through the use of reverse auctions when there is full and open competition. That is, greater price compression will be attained if the quantities and their estimated value are significant.

In reverse auctions, buyers specify the product they wish to purchase and a price they are willing to pay while sellers of the product compete to offer the best price for the product over a pre-determined time frame.

- 1) The buyer, or auction maker at the direction of the buyer, creates a list of items and product specifications and chooses a length of time for the auctions to run.
- 2) The buyer identifies potential suppliers who will participate in the auction.
- 3) The buyer or auctions maker conducts pre-award reviews of suppliers, including availability of contracts/schedules, ability to meet specifications and delivery times, QC, costs of past performance, issues of responsibility, etc.
- 4) This results in generation of an approved supplier list.
- 5) Specific terms and conditions of suppliers are identified (online listing accelerates the RFQ process and makes the entire supplier communication process more efficient).
- 6) Qualified suppliers are invited to participate in the bidding process.
- 7) All suppliers agreeing to participate in the auction are set up for the auction. This includes security and registration set-up, etc. Supplier must respond to the auctions maker with their intention to compete.
- 8) The auction is conducted. Suppliers then compete in real time for the purchase order by lowering their prices until the auction is closed.
- 9) The lowest bid wins the contract.

Benefits

- The acquisition process changes little when using a reverse auction to determine price.
- By facilitating sales at the lowest market price for the product or service, online reverse auctions provides significant cost savings. And this price is significantly lower than the historical price offered by the suppliers. Cost savings through online reverse auctions range between two and 20 per cent and in some cases as high as 50 per cent. Savings can also be realized through streamlined processes and the reduction of paper processing that comes with online reverse auctions. Internet costs orders are calculated to cost only \$7 in soft costs as opposed to a \$147 in a traditional purchasing format, as suggested by one manufacturer.
- Online auctions enable more competitors to access the market while giving agencies control over how many suppliers will participate. It provides more business opportunities to small businesses and will reduce their costs to discover, offer and market their services.
- By participating in online reverse auctions suppliers are afforded additional business opportunities that they may not have otherwise. Online auctions conducted real time provide them with market intelligence that may allow them to be more competitive in the next auctions event in which they participate. They may be able to get better prices from their suppliers or learn that they need to improve their business practices to become more efficient.
- Transparency in the government contracting process is critical. Online reverse auctions exude that valuable transparency. During the auctions suppliers have the added benefit of knowing the bids being placed by other suppliers (though the suppliers' true identity is revealed only to the auctions owner). Suppliers also benefit from the open and immediate feedback that is provided at the close of the auctions.
- The rapid bid, reverse bid and negotiation process shortens the cycle time for procurement process from weeks to hours. The likelihood of

other factors influencing the process, such as favoured suppliers and other subjective criteria, could be reduced. Additionally because the auctions process is automated, bidding and contract awards become closer to an administrative function. This gives buyers the freedom to focus more time on supplier qualifications and contract administration rather than bid analysis.

- Suppliers benefit by being able to make multiple online bids in response to other bids. This allows suppliers to be more competitive than they would be using a static quotes.

Some Issues

- It is most cost effective to use reverse auctions when purchasing large quantities for an item for which you can create very clear product specifications. It is very clear for the specifications to be as 'bullet proof' as possible.
- Suppliers are sometimes averse to participating in reverse auctions based on the misconception that reverse auctions result in contract awards based solely on the lowest bid. This is not the case. Reverse auctions are a dynamic pricing mechanism that is used to purchase quality products at the best possible prices.
- May not be suitable for complex systems integration task.
- Sometimes may end up in 'Winners Scare' syndrome.

E-Purchasing Barometer

Recently the Institute of Supply Management (ISM)/Forrester Research published findings of the survey they had undertaken to assess the current status of online purchasing. Given below are some of the salient features of the survey:

- Companies increasingly are using the Internet to purchase direct and indirect goods and services and they are saving money as a result.

- For the second consecutive quarter, the percentage of direct materials purchased using the Internet surpassed that of indirect materials.
- For the quarter ending September 2003, survey respondents spent an average of 13 per cent of their total direct materials spend using the Internet in Q3 2003, up from 12 per cent in Q2. Indirect materials spending grew from 11 per cent in Q2 to 12 per cent in Q3. Additionally, the percentage of companies that saved money resulting from their online purchasing climbed from 30 per cent in Q2 to 35 per cent in Q3.
- However, internal and external system integration is still a major drawback to e-procurement adoption.
- Non-manufacturing companies have made e-procurement and Internet-based sourcing a higher priority than manufacturers have, which also use alternative channels like EDI networks.
- **Only 25 per cent of companies participated in online auctions, and 33 per cent used e-marketplaces.** Nonmanufacturing companies are more advanced in their use of online marketplaces and companywide e-procurement tools. This group tends to consist of service companies that lack alternate channels for buying and have very specific direct purchasing needs.
- **Supplier collaboration increased in Q3.** 63 per cent of companies collaborated with suppliers online, up modestly from 61 per cent in Q2. However, satisfaction with suppliers' online capabilities showed little improvement in Q3.
- **Online RFP usage continues to rise.** During Q3, 69 per cent of companies used the Internet in their RFP process, up from 62 per cent in Q2.
- **Sourcing will be the key to unlocking value.** Tools for automating the purchase process turn out a secondary source of business value compared to the savings from negotiating and gaining employee compliance with strategic sourcing deals.
- Internal and external system integration is a major drawback to e-procurement adoption.

CONCLUSION

E-procurement, e-sourcing are here to stay, though they have a long way to go. Proponents of supplier relationships feel that this system is against their philosophies of looking at total acquisition cost where price alone cannot decide the supplier. However, for products that are 'by the market' where relationship building is anyway not possible this tool can be effectively implemented. Companies like Freemarkets, Commerce One have been able to succeed and create a substantial market share for themselves. Also sourcing sites like asiansources.com and thomasregister.com have become the gateway for several purchasing professionals the world over. The next decade is bound to witness a steep growth for such tools and philosophies.

ANNEXURE

A Paper on Reverse Auctions Case Studies

Extrapolate to 2010 the twin vectors of strategic supply management and e-procurement, and you won't find many professionals with titles like "buyer" or "purchasing agent". The reason is that most of the activities that occur in traditional buying processes – requisitioning, research, quoting, PO writing, supplier performance tracking, certification, expediting, "fire fighting" even negotiating –will be eliminated, automated, transferred to internal customers, or outsourced to suppliers.

— *Purchasing Experts.*

Reverse auction, is also known as an upside down auction where people can list what they want and need and have other people submit offers to them. When someone posts a reverse auction, he/she is not intending to sell something, but rather to buy something, either a product or a service. As reverse auction progresses, sellers bid down the price. Bidders bid more than once and their identities are unknown to one another. This results in dynamic competition and pricing that is closer to true market pricing.

It is usual understanding that reverse auctions work better for buyers than the sellers. Many suppliers are not only uncomfortable in using reverse auctions but are in fact averse to the whole concept. But in some instances, such as huge liquidations, suppliers favour reverse auctions. Suppliers that are low-cost producers also welcome reverse auctions because they play to their competitive strengths and they may not have the margin for marketing or sales staff. Though, it is also a fact that in an ideal scenario, the benefit of a reverse auction is that it lowers the cost of goods for the buyers, because the bidding process creates downward pressure on

prices. Companies have experienced savings in the range of 10–30 per cent through reverse auctions.

Reverse auctions is slowly gaining ground, with 30 per cent of company's purchases of indirect goods which account for 60% of its purchasing resources, it is actually not a surprise.

Case Studies in Reverse Auctions

1) Buying freight forwarding services

This case study is about procurement of overseas inbound freight services for a manufacturing company. The company already had a pool of freight forwarders, but was looking to optimize costs by getting access to alternative service providers. They had outlined the destinations and wanted the suppliers to provide low cost routes to these destinations.

Process in a nutshell

- Organization: Manufacturing company having large export business.
- Category: Overseas inbound freight.
- Objective: Optimize costs, routes to the defined destinations and suppliers.
- E-procurement process: As mentioned earlier, company already had some suppliers in their fold. However, they were open to including alternative suppliers in the reverse auction process. Hence the first step was to identify all such suppliers who had the capability to operate in international markets. Company created a detailed request for proposal, which gave details of all the 10 destinations it wanted services for. Finally, six freight forwarders were short listed who participated in the process of reverse auction.

Reverse auction process

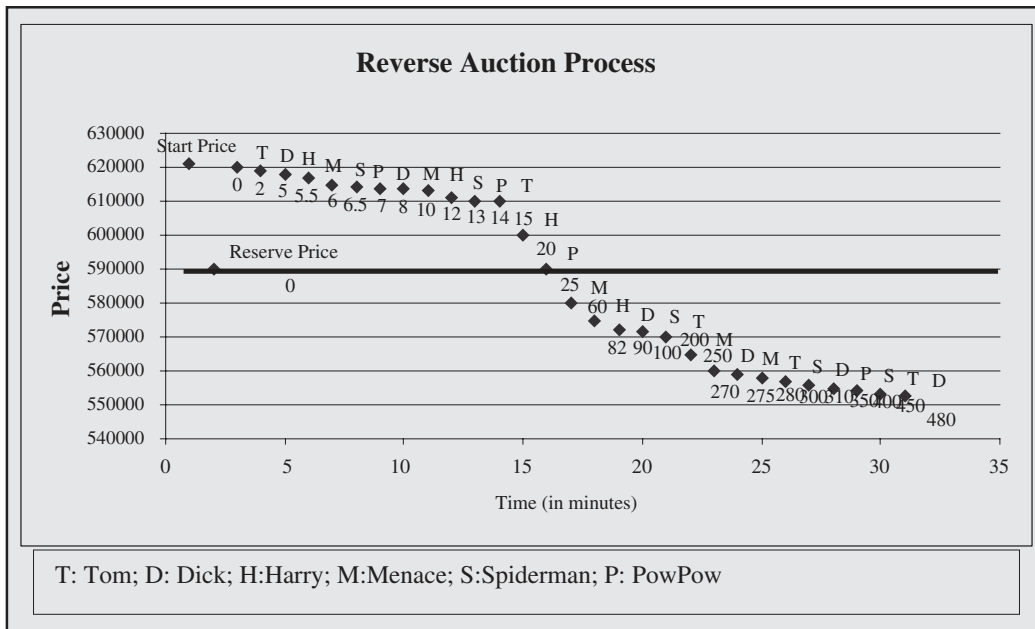
- Current freight costs: \$6,21,128
- Reserve price: \$5,90,000

- Bidding process – 8 hours, 6 suppliers, 30 bids
- Closing price – \$552,500

Summary of savings generated:

- Cost reduction – \$68,628
- Procurement cycle time reduction – 5 weeks to few hours
- Route optimization with alternative world class freight forwarders

Organization saved over \$68000 on a \$620,000 deal for a saving of 11 per cent. In addition, they discovered new suppliers and the process took place in less than one working day.



Case 2

This case study is about a governmental organization wanting to procure IT products. 15 different IT companies were made to participate in the reverse auction process. Items were bought in four different lots—desktops, light and heavy duty printers and laptops.

Process in a nutshell

- Organization: Government organization in the process of computerizing all its processes.
- Category: IT products in four lots.
- Objective: Optimize costs by getting the best price for the products.
- Requirement: 6000 desktops, 200 laptops, 700 each of light and heavy-duty printers.
- Schedule – One hour.
- Total time taken – Four hours.

Item price	Quantity	Start price	End price	Unit price	Price change
Lot 1 (500 MHz Laptop)	200	\$4,47,000	\$360,000	\$1800	19%
Lot 2 (667 MHz desktops)	6000	\$68,01,045	\$59,97,000	\$999.5	11 %
Lot 3(16 ppm printers)	700	\$12,50,666	\$6,49,000	\$927	52%
Lot 4(244 ppm printers)	700	\$12,40,000	\$6,37,000	\$910	51%
Total savings					\$2,095,711

CONCLUSION

Though the early focus was on indirect procurement (goods not part of production), direct procurement is slowly catching up. We are approaching an era when the distinction between direct and indirect procurement will blur and companies will start using such solutions to buy absolutely anything and everything.

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Logistics Management

“In the field of observation, chance favours only the prepared minds.”

— *Louis Pasteur.*

HISTORY AND EVOLUTION OF LOGISTICS

The 20th century has seen transportation related industry or profession experience a sea change. About 2700 BC, man realized it was possible to use the horse as a pack animal. Overland travel and transport speed increased significantly. Archaeologists believe that the very first step toward man-made transportation began in either Mesopotamia or Asia, sometime around 4000–3500 BC, with the invention of the wheel. By this point, man had long since domesticated the horse, and was using it to help him till the soil and plant crops. But the invention of the wheel eventually made man's ability to transport his crops from one place to another easy, and this gave birth to the idea of trade and exchange. The invention of the wheel led to the development of mass transportation, as man put his new invention to practical uses. Automation also improved travel by land. Mass transit became a standard, originally through the steam engine of the 18th century. But these early trains were slow and very often dangerous. In 1804, locomotives, which used steam to power a series of pistons (much like a steamship), came into use. The origin of the dugout boat is one of history's great mysteries. Historians are unable to pinpoint when or where the very first water vessel was set afloat, and even speculate that it might have been purely an accident, the

first time. But, however it happened, the addition of the boat changed the face of transportation. Boats allowed man to, for the first time ever, cross bodies of water without getting wet. Automation made an impact on sea travel also. On waterways, boats could only haul smaller loads at first, but over the centuries, loading capacity of water transports was expanded continuously. Driven by the requirements of the military, ships grew to considerable size. By the beginning of the classical period, the advanced cultures (the Romans, Greeks, and Phoenicians) could transport trade goods across wide stretches of the Mediterranean area in large quantities. Then, in 1958, the first nuclear-powered ship was launched. The next stride in transportation looked not to the land, or even to the seas, but to the sky. Although many people have toyed with flight over the millennia, the first sustained, controlled flight did not take place until December 17, 1903, at Kitty Hawk, North Carolina. Then, on July 16, 1969, American astronaut Neil Armstrong became the first man to set foot on the moon. In July of 1975, a joint American-Russian venture began, docking spacecraft together in space. From the wheel to the stars, man's travel has only ever been limited by the scope of his imagination.

The invention of the automobile and developments in production technology (assembly line, electronic control) revolutionized transportation. The transportation network of rails and roads became more and more closely meshed during the course of the 20th century as well. We reached a stage where aircraft and container ships provided problem-free transportation across the continents, and goods of all kinds arrived at almost every corner of the world via rivers, canals, and roads. All of this has been made possible due to the rapid development of transportation. Moreover as processes are becoming increasingly complex in companies—demands for new logistical concepts are increasing. Combined transport and modern technologies are playing a greater and greater role. Information technology and its applications to transportation also had a major impact on the growth of logistics. Today we are at the beginning of an explosion of logistics applications. The potential is enormous for providing a flexible and integrated logistics services.

The Internet and e-commerce is drastically changing the range, delivery time and the speed of information, as well as ordering and payment processes. Mass customization and increased customer revolution is also putting increased pressure on logistics processes. The 'atomization' of shipments into the smallest units and extremely high numbers of customers means that the existing facilities and warehouse management systems get overextended and stretched. The high proportion

of logistics costs requires completely new solutions. On the one hand, there is a clear trend towards value-added logistics, which in addition to the sophisticated IT-based transport services, also comprises tasks such as packaging, protective measures, repair and installation services. On the other hand, it deals with innovative distribution concepts, so that traffic problems do not escalate further.

DEFINITION

The linguistic roots of the term logistics lie in the Greek ‘logos’ (intellect, arithmetic) on the one hand, and in the Franco-Germanic root ‘loger’ (to supply, to support). Only in the last 30 years has the modern term ‘logistics’ been used to describe business management issues. Though transportation management and materials management by companies were discussed and attempted in the ’50s, research was normally restricted to just some of the aspects of today’s comprehensive understanding of logistics.

The simplest way to describe logistics is to say that it is all about ways and means of meeting the demand for materials. That is, satisfying the customer with what he wants, when he wants, where he wants, etc. A popular expression used to describe logistics is that it should ensure that the right materials, in the right quantity, are at the right place at the right time. This may sound rather simple and straightforward but all of us have almost certainly experienced situations when we strongly felt that some or all of the above requirements were not fulfilled. Logistics concentrates on the dynamic processes related to the flow of materials and the relationship between the materials and their use at different facilities. The most widespread definition of logistics comes from the Council of Logistics Management, CLM, which says that “Logistics is that part of the supply chain process that plans, implements and controls the efficient, effective flow and storage of goods, services and related information from the point of origin to the point of consumption in order to meet customers’ requirements.”

ROLE OF LOGISTICS MANAGEMENT

Logistics plays a dominant role in SCM. Supply chain and the philosophies therein can create an opportunity while logistics management with its tools and

processes, fulfils an opportunity. It is essential to provide the exact distinction between logistics and supply chain and thus define the exact role of logistics in the broad framework of SCM.

Right time: Customers have become very finicky and precise about time. Hence it is essential that they get what they want as and when they demand it. Supply chain with its tools and philosophies can schedule the production and get the product ready but it is logistics management that has to ensure that the product reaches the customer on time every time. Hence logistics management becomes a very critical activity. There can be several impediments to appropriate fulfilment. Transportation issues, traffic problems, strikes, octroi regulations, etc. are some of the problems that regularly hamper the efficient functioning of logistics management. There have been cases in history such as the famous Toys 'R' Us story where manufacturing and production was not an issue but distribution and logistics became the stumbling blocks in fulfilment. Hence a good logistics management system is essential to encash the opportunity created by supply chain management.

Right price: Immense competition and rising customer expectations have put tremendous pressure on price. Companies have implemented supply chain philosophies and tools to ensure price competitiveness. They have also taken several measures to eliminate waste and hence cost bulge. And logistics being the major cost component (almost 30 per cent) it becomes critical. Hence, clearly if companies have to offer the right price to the customers, logistics has to be cost competitive.

Right quantity: How much does the customer want? SCM can identify how much quantity the customer requires to get satisfied, while it is logistics management that can ensure that the customer gets what he wants.

Right place: Driven by the demanding customers and competition, companies are going nearer and nearer to where the customer is. In this context, the right place has become very relevant and critical. Right place could be the retailers' end or the actual place where the customer is located. Usually manufacturing companies leave this to the retailers. Implementing 'free home delivery' and other concepts ensure that right place lies with this second last end of the supply chain. This also puts additional pressure of 'right time' on the supply chain as the distribution from wholesaler to the retailer has to be completed in such a way that there is adequate time for the last distribution from the retailer to the customer.

Right quality: Once again, supply chain can ensure quality of product at the company's end only. The responsibility of ensuring quality at the customers' end rests with logistics management. Accidents, material lying in godowns, octroi posts, traffic jams can all hamper quality before they reach the customer. Hence companies have to implement very good logistics systems that will ensure quality at the customers' end also.

FRAMEWORK OF LOGISTICS MANAGEMENT

Logistics is responsible for all the movement that takes place within the organization (refer Figure 11.1). Whether it is the inbound logistics of incoming raw material or movement within the company or the physical distribution of finished goods, logistics encompasses all of these.

Physical supply: Physical supply means linking of suppliers with the internal operations. This is one of the most crucial elements of logistics as production cannot start unless material from the suppliers is available. Suppliers are scattered and have varying lead times, hence coordinating and synchronizing this activity becomes a tough job. Associated with this are the critical questions such as: From whom to order? How much to order? When to order? Which mode of transportation should be used? Where to store the material? etc. Companies prefer nearby suppliers unless the price/quality differential is too glaring for the reason that the physical supply quantity can be less and more frequent. The philosophy of JIT is based on the principle of less quantity in lesser interval resulting in more deliveries. This also means that companies have to carry less raw material inventory which also frees up the working capital. The problem with this is, of course, congestion on roads as trucks have to constantly ferry material to the manufacturing units from suppliers. More burden on logistics. For suppliers who are located at a distance and cannot send the material often, vendor-managed inventory



Figure 11.1 Logistics framework

(VMI) is the solution. Under VMI the supplier maintains a warehouse near the manufacturing facility and supplies as and when material is desired and required.

In order to reduce the burden on logistics, some of the manufacturing companies send their own trucks to some suppliers who lie on a predefined route and get the material picked up themselves instead of the supplier doing it. The truck makes a round trip and will pick up material from 7–8 nearby suppliers. This way one truck does the job of otherwise 7–8 trucks reducing load on logistics. This is an innovative method used by several companies to reduce burden on logistics. “Physical supply also sometimes doubles as a cash carrying activity, i.e. after the raw material is delivered it collects cash for the quantity of raw material and takes it back to the supplier.”

This of course is difficult to implement in the event of JIT delivery. In such a case usually the settlement is done over a period of time.

Internal operations: This means moving the material internally within the manufacturing facility. That is, raw material when it comes from the supplier is stored in the incoming warehouse, material from there has to be taken to the shop floor. In case of batch production, the WIP material has to be moved from one place to another. The finished product needs once again to be moved to another warehouse for packaging or for physical distribution. This also requires coordination between various activities and functions. However, being internal to the organization, the load on logistics is not much.

Physical distribution: This encompasses the outbound material movement, which links the operations with the customer. This is a most crucial part of logistics and can make or mar the company's prospects in the eyes of the customers. This is responsible for achieving all the five rights discussed above. This part of logistics addresses some of the critical aspects such as expected level of customer service, cost associated with servicing the customer at the prescribed level, product mix to be stocked at each distribution facility, transportation modes and transportation services to be used.

This type of logistics also has to perform some other vital activity—that of carrying information and in some cases even of carrying cash. The logistics providers or the truck driver needs to be properly trained to pick up information more than what is provided. That is, he needs to understand whether he is welcome when he reaches the retailer, whether there is a stock-out situation when he delivers the

material or whether adequate material is still available that could have lasted some more days, any customer response or reaction in case any sale transaction takes place in his presence, how and where the material is placed after he delivers, etc. All of this is extremely vital information, which needs to be read through. Some companies are exploring the idea of having a truck drivers training programme where they would be trained to understand the body language of the retailer and also pick up other relevant information. Settling of bills and carrying cash is another activity sometimes performed by this part of logistics management.

ELEMENTS OF LOGISTICS

Logistics consists of several elements that need to be considered and coordinated for successful results.

Elements of logistics (Figure 11.2) have been classified into two categories: one that is linked to operations and is responsible for undertaking the routine and regular responsibilities and the other that is linked to strategy and is responsible for policy making. Some of these strategic activities listed above might not be directly under the purview of logistics, but require inputs from logistics.

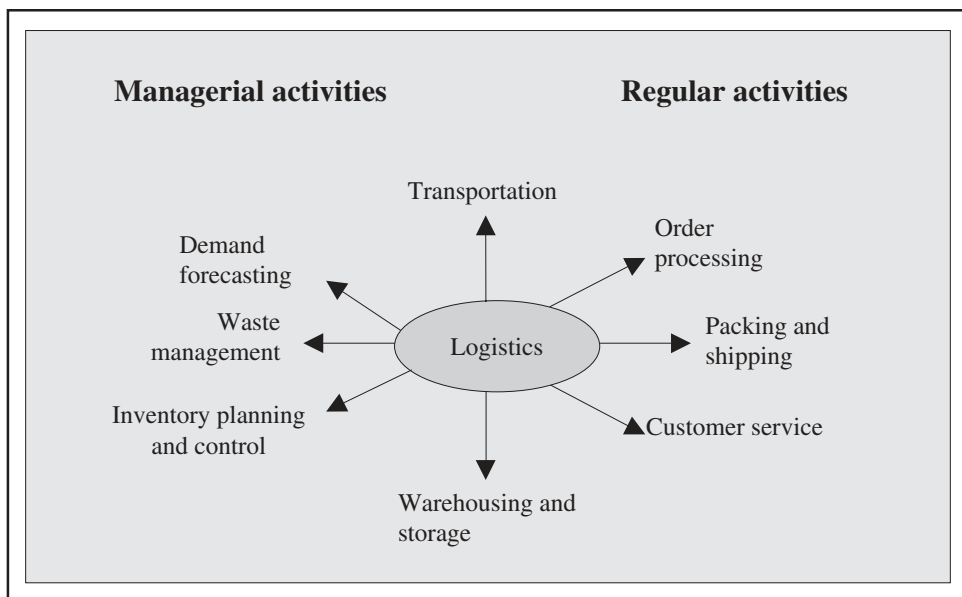


Figure 11.2 Elements of logistics

MODES OF TRANSPORTATION IN LOGISTICS

Rail, road, air, water and pipeline are the five modes of transportation used by logistics management to transport material from one place to another. Each of these modes has some advantages and some limitations. A logistics expert needs to understand these and based on priorities, product type, lead time, etc. decide the appropriate mode of transportation.

AIR

This mode of transportation is usually used for the delivery of goods from distant suppliers, usually the ones that are not connected by any other mode of transportation. This mode of transport is useful to deliver products with short lead times, fragile goods and products that are not bulky. Also the products that are in high demand and in short supply are also at times airfreighted in order to meet customer demands. The bulk/value ratio will be a determining factor.

Advantages

- Fast delivery, usually between 24 and 48 hours
- Faster fulfilment of customer orders
- Ideal for perishable and other products with short life
- Reduced lead time on supplier
- Lesser inventory
- Improved service levels

Disadvantages

- Flight delays and/or cancellations especially when direct connections are not available.
- Customs and excise formalities leading to delays.

- High cost.
- Suppliers/customers are not always located near a rail freight depot and delivery to/from the depot can be costly and time consuming.

SEA

Sea transportation is used by businesses for the delivery of goods from distant suppliers. Most sea transportation is conducted in containers which vary in size. Goods can be grouped into a container (LCL) or fill a container (FCL). Sea tankers are used for bulk shipments of loose goods such as oil, grain and coal.

Advantages

- Ideal for transporting heavy and bulky goods.
- Suitable for products with long lead times.

Disadvantages

- Longer lead/delivery times.
- Problems arising due to bad weather.
- Difficult to monitor exact location of goods in transit.
- Customs and excise restrictions.
- High cost.
- Suppliers/customers are not always located near a rail freight depot and delivery to/from the depot can be costly and time consuming.

RAIL

Rail transportation is popular with businesses for the delivery of a wide range of goods including post, coal, steel and other heavy goods.

Advantages

- Faster and quicker.
- Ability to carry high capacity.
- Cost effective.
- Safe mode of transport.
- Reliable.

Disadvantages

- Subject to unforeseen delays and/or accidents.
- Completely governed by timetable and schedule of railways.
- Suppliers/customers are not always located near a rail freight depot and delivery to/from the depot can be costly and time consuming.

ROAD

A very popular mode of transport used by suppliers and businesses to deliver orders. Many transport companies provide scheduled delivery days and next day delivery services, depending upon your needs. Goods can be packed/grouped in box vans or in containers which are also used for sea transportation.

Advantages

- Cost effective.
- Fast delivery.
- Ideal for any short distances.
- Refrigerated vans can be easily used for transporting perishables.

- Easy to monitor location of goods.
- Mass movement of goods.
- Point-to-point service.
- Easy to communicate with driver. Usually companies ask the driver to call the company every couple of hours.

Disadvantages

- Delays due to traffic jams, octroi snarls, etc.
- Problems due to vehicle breakdown, accidents, etc.
- Goods susceptible to damage and losing quality.
- Heavy dependability on weather.

PIPELINE

Advantages

- Mass movement of liquids and gases.
- Low operating costs.

Disadvantages

- Limited applicability.
- Not widespread.

INFORMATION TECHNOLOGY IN LOGISTICS

The application of IT can support logistics and help in resolving several problems. Over and above assisting in managerial tasks such as planning, deciding on the

optimal route of transportation and allocation, distribution, etc. IT can play a vital role in logistics.

Tracking goods in transit: One of the major problems in logistics has been lost and untracked parcels thereby affecting inventory policies, etc. Real time tracking of goods throughout the supply chain provides excellent opportunities for improving customer service. Real time information on delivery time supports just-in-time manufacture and retail, enabling organisations to make strategic decisions with full confidence in the availability of goods. Goods tracking is also important for direct end-customer service. Several leading package delivery companies are offering parcel tracking via the Internet as a fundamental element of the service. There are many additional areas where accurate, real-time goods tracking can deliver significant improvements. For example, lost luggage is estimated to cost the airline industry in excess of \$100 million annually. Any improvements in this area not only reduce the cost of compensation payments to customers but also significantly improve customer service. The standard way to identify and follow a product on its journey through factories and down the supply chain has long been the familiar bar code. However, bar codes have a lot of problems and the use of bar codes also requires a lot of labour. According to industry figures, as many as 60 per cent of the workers in warehouses spend time validating bar codes. Items have to be lined up individually for scanning, even in highly automated identification systems such as those at major package-handling firms. Companies the world over are trying smart tags, specifically, radio frequency identification (RFID) for tracking parcels and other goods.

RADIO FREQUENCY IDENTIFICATION (RFID)

Radio frequency stands for electromagnetic waves of a wavelength suitable for wireless communication. The RFID system uses a plastic tag, sometimes as small as two matches laid side by side. Embedded in it is a digital memory chip the size of a pinhead. The tag contains information about the product, viz. its origin, its destination, etc. In bar codes, products have to be properly aligned to the scanner for reading the information stored on it. However, this is not a problem with RFID as radio is used. One major advantage with these radio tags is that without touching or removing the tag, a user can alter the information on it. From changing the itinerary of a component on the factory floor to breaking this information

in parts, to actually changing the entire information, all of this can be done without touching or going near the tags. The tiny RFID tag has an antenna of its own, a loop of copper plating. This antenna helps a remote device perform the read/write operations. By using RFID tags throughout the supply chain, configure-to-order assemblers could closely coordinate the arrival of components for final assembly.

RFID can allow the manufacturer schedule productions as he can know in advance exactly when the shipment is due and when the products are arriving.

DISTRIBUTION RESOURCE PLANNING (DRP)

Distribution resource planning (DRP) is a general framework for planning and managing inventory in distribution networks. The DRP framework can be applied to complex distribution networks with thousands of unique stock-keeping units and hundreds of stocking locations.

DRP determines the need to replenish inventory at branch warehouse. It provides with a time-phased order requirements by date. The overall intent of DRP is to schedule inventory levels specified by management policies. DRP is a push system managed from a central location. Some companies may prefer to use decentralised decision making at each warehouse, replenishing stock based on warehouse orders using local re-order points.

An advanced version of DRP is DRP II which is a planning philosophy which permits the planning of all resources within a distribution firm including business planning, marketing/sales, procurement, logistics, distribution requirements and financials. The system logic provides the means to define a business plan, a marketing plan, a forecast and a master delivery schedule (master schedule) and focus resources upon a common game plan and related performance measurements. DRPI and DRPII have a similar relationship for managing distribution operations as MRPI and MRPII have for managing manufacturing resources.

GEOGRAPHICAL INFORMATION SYSTEM (GIS)

Geographical information systems (GIS) enable storage, manipulation, analysis and display of geographically referenced data. The rate of growth in the GIS

industry has accelerated in the 1990s as businesses have adopted GIS to relate different sources of information to one another through a common geographical reference. The value of GIS lies in enabling users to integrate different sets of data through a common geographical reference system such as latitude and longitude, eastings and northings or a common pre-defined geography such as postal codes, etc. Users can then interrogate these data based on their geographical relationships and display the results on a map, in a table or on a chart.

The greatest challenge of logistics is routing of vehicles especially in India as the geographical spread is fairly large. GIS can simplify this task by reducing the complexity by bringing out subtle geographic patterns and relationships that can form the basis of good decisions. Some of the other applications of GIS in logistics are:

- Vehicle tracking and dispatch involves being able to keep track of the location and the inventory on board every vehicle in the field and having the latest information on its position and operating status.
- Route analysis is the operation which aims at minimizing the cost of travel involved in transporting goods from one location to another whether in terms of trips required or time or distance or a combination of these.
- Warehouse operations become significant in cost reduction when the operation grows big and each warehouse becomes a very large operation in itself.
- Facilities and depot management involves minimizing waste by considering the locational aspects, the available capacity, the inventory in question and the range or effective covered area of each facility.
- Routing and scheduling aims at minimizing all kinds of costs including mileage, overtime and maximizing all attendant benefits including customer satisfaction, adherence to schedules, etc.

Global positioning systems or GPS are becoming cheaper, more cost effective and widespread. If the trucks are fitted with radio transmitters and GPS, the radio transmitters send the location of the truck at specific intervals to the central control, where GIS software interprets the signal and posts it on the town map as symbol. This enables the dispatcher to track the location of this truck and the rest

of the fleet in real time. Along with other information such as traffic movement, etc. the dispatcher should also be able to leverage the real time traffic conditions to modify the route the truck could or should take to minimize delays.

A route analysis system of GIS has the ability to use information pertaining to route density and could utilize this kind of data to generate the most efficient routes that any vehicle should take based on the current inventory load it is carrying. The system can also help the driver find the address by generating map and providing the driving directions.

The system can also be joined to an inventory control system in ERP software like SAP R/3 which could help create geographically aware inventory 'packets' for delivery, taking into account the locations of the address and the capability of the truck that will service the specific route.

Though currently there are several constraints in India such as getting information related to route density, etc. we are not far away from being able to utilize GIS optimally in logistics.

OUTSOURCING LOGISTICS

Outsourcing, listed by *Harvard Business Review* as one of the most important management concepts of the past 75 years, has become a readily accepted means of increasing performance of non-core supply chain activities. Outsourcing allows organizations to focus on their core competencies, to provide a differentiated level of customer service, and to take advantage of greater operational flexibility.

As late as the 1990s, companies only trusted themselves and as a result they kept a firm grip on everything—procurement and production as well as the supply or distribution of the finished products to the markets. Companies believed that they could do everything better than anybody else and this belief also applied to the logistics sector. The business enterprises owned a fleet of trucks and had extensive warehouses of their own. However, in the course of the years, industry began to get away from this full autonomy in the field of logistics. The importance of having an outsider catering to the services without companies bothering to take care of the fleet, their maintenance, etc. was overwhelming indeed to consider outsourcing. Traditional transportation, warehousing and transshipment services

were increasingly subcontracted to specialized forwarding companies that assumed the responsibility for transporting the goods and managing the warehouses.

With the emergence of IT and information systems and its subsequent application to logistics, the sector then took another leap forward. All of this enabled companies with the technological tools that provided unhindered information needed to make processes more effective. In the past, the supply of production facilities and the markets had to be safeguarded by keeping high inventory levels. With the advent of the new technologies, production losses and supply bottlenecks could be avoided through perfectly coordinated procurement, production and distribution networks.

The problems, however, persisted as the supply chains found in many companies were not capable of meeting these requirements. The use of more flexible production processes while at the same time cutting down inventories meant that the service providers had to manage to deliver the materials to the assembly lines exactly when they were needed in order to ensure a smooth production flow. As a result, just-in-time delivery as well as electronic shipment tracking at the national level became established standards among the major logistics service providers. On

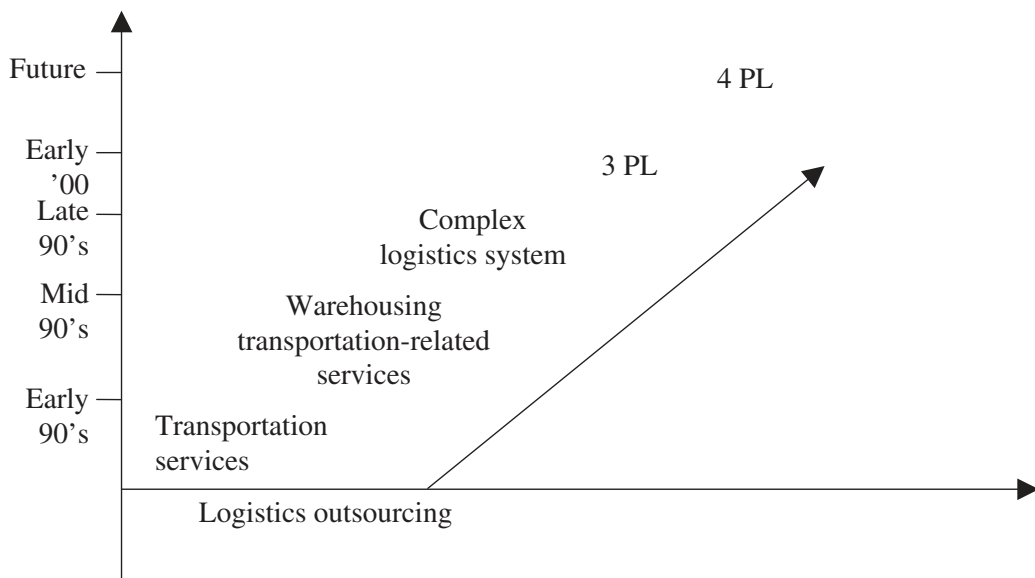


Figure 11.3 Evolution of logistics outsourcing

the other side of the spectrum, the customer was becoming more and more demanding and was refusing to accept what the companies were making for him. He wanted to dictate not only the product but also the quantity, quality and place of delivery. This put more responsibility and onus on logistics providers. As a result, the logistics companies considerably improved their internal workflows by establishing hubs (transshipment centres where product flows are bundled and distributed) and by introducing state-of-the-art traffic routing systems. Outsourcing of logistics became an industry norm. Figure 11.3 traces the evolution of logistics from basic transportation services of the early 90's to the 4PL, which is currently becoming a norm.

REASONS FOR OUTSOURCING LOGISTICS

There are several reasons why companies outsource—strategic reasons, financial reasons and service related reasons.

Financial reasons	Strategic reasons	Service related reasons
Asset release	Non core	Flexibility
Cost reduction	Access to the best in breed capabilities	More service focused
Consolidation	Ability to use flexible manufacturing systems	To become more agile and responsive
	Exert greater control on supply chain	

THIRD PARTY LOGISTICS PROVIDERS (3PL)

A third part logistics provider (TPL) is defined as the services offered by a middleman in the logistics channel that has specialized in providing, by contract, for a given period, all or a considerable number of the logistics activities for other firms. A logistics partnership is defined as a long-term formal or informal relationship between shippers and logistics providers to render all or a considerable amount of logistics activities for the shipper.

Typical services outsourced to TPL are transport, warehousing, inventory, value added services, design and reengineering of the chain. The first three are the most common services of TPL and also the most common services outsourced from industrial firms. But users are increasingly outsourcing their information needs to 3PL providers. Some of the most frequently outsourced information applications are freight payment/accounting, transportation planning/optimization, international documentation and warehouse management systems. But 3PL providers must eventually get to the point where they can offer 'one-stop shopping'. That is, all needs of the users pertaining to the movement of goods should be addressed by the TPL.

Some of the outsourced activities

WAREHOUSING AND WAREHOUSE MANAGEMENT

In outsourcing warehouse management activities, the business strategy is to reduce costs associated with distribution and warehousing operations. The value in outsourcing warehousing activities results from reduction of fixed assets associated with the physical warehouse(s), increased capacity for executing transactional and tactical warehouse processes and overall operating cost reduction.

In addition to capital and cost-related benefits, there are other reasons to consider outsourcing of warehousing activities, including access to leading practices, access to 'best of breed' warehouse management systems and incentive or performance-based contracts that drive continuous improvement.

These benefits should be balanced against potential weaknesses, including a tendency for "one size fits all" approach by logistics service providers and that efficiency gains may be limited to activities within a facility rather than on the entire supply chain or distribution network. Transition from internal management of warehousing operations to an external provider will require significant upfront involvement in providing initial data, industry or customer expertise and oversight during transfer of responsibilities.

FREIGHT PAYMENT AND AUDIT

The objective in outsourcing freight payment and/or freight bill auditing is to reduce the cost and complexity associated with logistics-related labour. The

advantage in outsourcing freight payment and/or audit activities is that costs and issues associated with managing a typically low skill level and/or part-time pool of workers. In addition, HR-related tasks, such as interviewing, benefits management and other functions, can be eliminated for these workers as a result of the outsourcing process.

Although the expertise and contributions of the outsourcing provider are likely to be somewhat limited to lower value activities, cost reductions and efficiency gains can be expected to result from scale and knowledge of site and/or market specific conditions. However, given the nature of freight payment and freight bill auditing activities, there are typically limited opportunities for innovation that would result in order-of-magnitude improvement.

Outsourcing freight payment and/or audit activities may require multiple providers to manage regionalized or global operations and may also require a substantial continued involvement to provide oversight and industry-specific expertise, particularly through an initial transition period.

TRANSPORTATION AND FREIGHT MANAGEMENT

The overall business strategy in outsourcing transportation and freight management activities is to reduce the cost and complexity associated with these logistics processes, while simultaneously adding value and competitive differentiation.

The advantages to outsourcing transportation and freight management activities are that logistics service providers are much more likely to possess a greater capacity to efficiently execute both the transactional and tactical processes involved, as these are core competencies. In addition to execution efficiencies, there are other reasons to consider outsourcing of transportation and freight management activities, including access to leading practices, access to 'best of breed' transportation management systems and, similar to outsourcing warehousing activities, utilization of incentive or performance-based contracts that drive continuous improvement.

Like any outsourcing activity, the benefits need to be balanced against potential weaknesses. Asset-based logistics service providers are not likely to be mode or carrier neutral. That is, they will tend to exhibit a bias for modes and carriers that

provide the greatest financial incentive. Continuous innovation and/or optimization can be difficult to achieve because of conflicting objectives between the provider and the client company, which can be overcome by structuring performance-based contracts with improvement incentives.

Advantages of outsourcing to a TPL:

- Asset reduction.
- Workforce reduction.
- Freedom from restrictive labour environment.
- Expanded geographic coverage.
- Operational flexibility.
- Reduced cycle time/improved responsiveness.
- Supply-chain integration.
- Logistics operations cost reduction.

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FOURTH PARTY LOGISTICS PROVIDERS (4PL)

4PL is a new concept in supply chain outsourcing. It is the next level in logistics outsourcing and is considered as a path to achieve more than the one time operating cost reductions and asset transfers of a traditional outsourcing arrangement. A 4PL forms an alliance between best-of-breed third party service providers, technology providers and management consultants and this helps them provide unique and comprehensive solutions that go beyond the traditional domain of logistics outsourcing.

A fourth party logistics provider is a supply chain integrator that assembles and manages the resources, capabilities and technology of its own organization with

those of complementary service providers to deliver a comprehensive supply chain solution. Thus a 4PL solution leverages the combined capabilities of both management consulting and third party logistics providers.

While the TPL providers have focused on operational issues such as implementation and execution, a 4PL brings in managerial inputs to the table, thereby providing the complete supply chain synchronization and collaborative advantages.

To build up this strength, many third party service providers are going for collaborations mainly with consultancies and technology providers. Now corporations are outsourcing their entire set of the supply chain process from a single organization which will assess, design, make and run integrated comprehensive supply chain solutions.

STAGES OF FOURTH PARTY LOGISTICS SOLUTIONS

1. Reinvention

At the highest level of fourth party logistics, is reinvention. Reinvention takes advantage of the traditional supply chain management consulting skills, aligns business strategy with supply chain strategy and is facilitated by technology that integrates and optimizes operations both within and across participating supply chains.

2. Transformation

The next level is transformation which focuses on improving supply chain functions that are internal to the organization. This includes sales and operation planning, distribution management, procurement strategy and customer support. Technological leadership and excellence is leveraged with strategic thought, process redesign and organization change management to improve and integrate these supply chain activities by bringing about the best breed solution. The main thrust of a 4PL is bringing the best in breed applications.

3. Implementation

How to efficiently use and implement solutions provided by best in breed consultants to leverage the advantages of supply chain management is the next level. This includes business process realignment, technology and system integration

across the client organization and service providers and transition of the operators to the delivery team.

4. Execution

The fourth party logistics provider takes the operational responsibility for multiple supply chain functions and processes. It covers transportation management, warehouse operations, manufacturing, procurement, supply chain, information technology, demand forecasting, network management, customer service management, inventory management and administration.

In summary, the fourth party logistics responds effectively to the broad complicated needs of today's organizations by delivering a comprehensive supply chain solution. This solution is focused on all elements of SCM, continuously updated and optimized technology and is tailored to specific client needs.

Information Technology can greatly influence and enhance the effectiveness of fourth party logistics. Implementing systems at levels of ERP, DSS, etc. at both transactional and functional levels can allow an organization to redirect the product flow, if desired, and forecast the volumes. It also allows the user to track performance accountability at all levels within the supply chain line while monitoring continuous performance opportunities.

COST EFFECTIVENESS OF FOURTH PARTY LOGISTICS

1. Revenue growth by enhanced product quality, product availability, and improved customer service, all facilitated by the application of leading technology.
2. Operating cost reduction can be achieved through operational efficiencies, process enhancements and procurements. Savings will be achieved by complete outsourcing of supply chain functions and not just selected components.
3. Fixed capital reductions will result from capital asset transfer and enhanced asset utilization. The fourth party logistics organization will own physical assets through freeing up the client organization to invest in core competencies.

CONCLUSION

Logistics is like the arterial system of the body that supplies blood to various parts of the body. It is as critical as that and even one small miss can spell a serious problem for the company. This is also one area of the supply chain that is growing at a tremendous pace. The time is not far when we will have 5PLs and 6PLs who will probably even do part of the manufacturing and marketing for the company.

ANNEXURE

A Paper on the Services provided by the Logistics Providers

The logistics industry is in the midst of a transformation as the companies are increasing their dependence on the logistics providers and logistics providers on the other hand are relying on IT to optimize storage and movement of inventory on the one hand, while including managerial aspect and offering to undertake the whole logistics operation for the company, on the other hand. This paper looks into this transformation and identifies areas of immediate opportunity for software, hardware and services organizations targeting this segment. It also outlines the various activities performed by the logistics providers.

Logistics is defined as the various activities concerned with effective and efficient movement of raw material, semi-finished goods and finished packaged products from one business to another and from manufacturers/distributors/retailers to the end customers. The activities include freight transportation, warehousing, material handling, protective packaging, inventory control, order processing, marketing, forecasting and customer service. The logistics market is big and it amounts to 10–15 per cent of every product produced.

Logistics can be classified into two categories: business-to-business logistics (B2B logistics) and business-to-consumer logistics (B2C logistics). The bulk of the activity takes place in the area of B2B logistics which is further divided into two distinct categories: inbound logistics and outbound logistics. The former refers to the management of material movement to the manufacturer. This includes the movement of raw material, semi-finished parts, components, spare parts, etc. to the manufacturer from the various suppliers. Outbound logistics refers to the management of movement of final products from a manufacturer to the wholesaler and retailers.

B2C logistics, also called retail logistics, is the management of goods delivery from manufacturers/distributors/retailers to the end consumers, who use these products directly.

ROLE OF LOGISTICS PROVIDERS

Logistics providers provide services for both the buyer and the seller. That is they become the buying arm of the buyer and the selling arm of the seller. Some of the basic services provided by the logistics providers for the buyer and the seller are:

- Physical flow
- Information flow
- Documentation flow and
- Financial flow

Physical flow comprises the following activities:

- a) Consolidation of cargo,
- b) Visibility of purchase order,
- c) Purchase order management,
- d) Piece-wise planning of container,
- e) Other value-added services such as bar code scanning (bar codes are usually sourced by the seller but when required Logistics Providers help the buyer or the seller in the process),
- f) Customs clearance,
- g) Palletisation,
- h) Choosing an appropriate shipping line, etc.

Information flow comprises the following activities:

- a) Trade compliance,
- b) Delivery security,
- c) Seller follow-up, etc.

Documentation flow means preparing or helping the client prepare the following documents:

- a) Post-shipment documentation,
- b) Commercial documentation,
- c) Bill of lading,
- d) Container manifest, etc.

Financial flow refers to managing or carrying cash in lieu of material from the buyer to the supplier.

The 4 PLs who offer more mature services that also include managerial inputs provide the following services:

a) Supply chain management

Several companies wanting to globalize their operations need help in designing their global supply chain. They have little or no understanding of the markets they want to venture into. Usually such a 4PL is a global company having clients and relevant experience in several countries. This gives them not only the required skill to handle international operations but they also provide necessary infrastructural support required for handling such operations. This gives companies confidence to venture out in unknown markets.

b) Consolidation and vendor services

International forwarding, documentation and compliance are a vital requirement and can prove to be very difficult and challenging especially for small companies

who do not possess much relevant experience in the field. 4PLs with their wide network and capacity make this process easy by consolidating merchandise, information and documents close to the origin or sourcing locations.

c) Warehousing and distribution

The core competency of businesses engaged in manufacturing is manufacturing and they need a solution that will allow them to focus on that without having to bother about warehousing and distribution issues. 4PLs, by providing customized warehousing and distribution solutions improve inventory management, reduce operating costs and speed order cycle times and most importantly allow companies to focus on their core competency.

d) Global freight management

Most of the leading logistics providers provide comprehensive transportation and forwarding services. This gives them international purchasing power to negotiate the best rates from top-rated carriers.

e) Manufacturing support

Manufacturers can reap the benefits of just-in-time inventory management by utilizing the specialized facilities, high technology capacity of the 4PL.

f) IT solutions

IT is another constantly evolving area which requires constant updating. 4PL with their reach and understanding of global trends take up the responsibility of providing the best practices and innovative applications of proven supply chain technologies. This automatically creates a competitive advantage for the company's business.

FUTURE TRENDS

Logistics providers will soon become the lead logistics provider for the company and have the responsibility of playing an end-to-end role in the company's logistics function. Their role will, however, be much more broad based and will also include activities such as training of vendors in customer service, communication relating

to shipping, enabling and training vendors with web-based tracking, etc. These training programmes are aimed at updating the vendors with the latest in shipping and logistics.

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Books

1. *Keeping Score: Measuring the Business Value of Logistics in the Supply Chain*

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Power of Outsourcing in Supply Chain Management

“It’s not what you don’t know that hurts you. It’s what you know that ain’t so.”

— Mark Twain.

Outsourcing, once a mere option, has today become a competitive imperative. The growth of the Internet, customer revolution, rise of mass customization, severe competition etc. has forced the companies to focus on core competencies instead of vertical integration. This means that original equipment manufacturers (OEMs) must ideally contract out part or all of manufacturing, assembly, distribution, and support operations. What to outsource has historically been decided by the question, “Is it strategic to my business?” If the answer is yes, you would keep it. If no, farm it out. Today, companies are asking a different question: Is it my core competency? If no, then it is ripe for outsourcing, whether it is ‘strategic’ or not.

The ‘trendsetter barometer’ conducted by Coopers and Lybrand LLP, contraction shows that 83 per cent of America’s fastest growing companies have turned to outsourcing for one or more functions.

WHAT IS OUTSOURCING?

Outsourcing is defined as the contracting of one or more of a company’s business processes to an outside service provider to help increase shareholder value, by primarily reducing operating cost and focusing on core competencies.

CIO defines outsourcing as an arrangement in which one company provides services for another company that could also be or usually have been provided in-house.

Automatic data processing Inc. (ADP) defines outsourcing as the contracting out of a company's non-core, non-revenue-producing activities to specialists. It differs from contracting in that outsourcing is a strategic management tool that involves the restructuring of an organization around what it does best—its core competencies.

WHY DO COMPANIES OUTSOURCE?

There are several reasons why outsourcing is becoming a habit. The simplest reason to outsource is to alleviate administrative burdens and focus on strategic areas.

As the companies move from non-outsourcing environment to an outsourcing environment the profile of the time spent by the executives on various activities change dramatically. According to Figure 12.1 in a non-outsourcing environment, executives spend 60 per cent of their time on administration matters, while 30 per cent on tactical issues and this leaves only 10 per cent of their time to

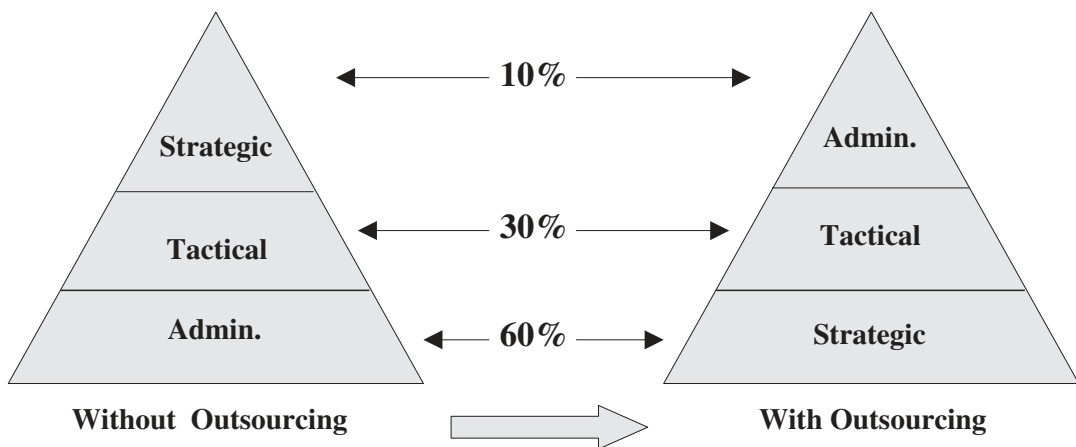


Figure 12.1 The time spent by companies on various activities in outsourcing and non-outsourcing environments

focus on strategic matters. On the contrary when they switch to an outsourcing environment and outsource some of the activities they need to spend only 10 per cent of their time on handling administration issues, 30 per cent time they focus on tactical matters while 60 per cent of their time they can devote to thinking, strategizing and planning.

Some other reasons behind outsourcing are:

1. **Reduce costs:** A company may emphasize cost savings for a variety of reasons, such as being in a poor financial position, or because of a goal to increase profits. Reducing costs by using a supplier is possible, but not in all situations. A supplier has clearly lower costs, if it can centralize the work of several companies at one location, such as central truck maintenance facilities or a data processing centre. It can also lower costs if materials or supplies can be bought at lower costs by using volume purchasing. It can also purchase assets from a company and then lease the assets back as a part of an outsourcing deal, thereby giving the companies an upfront cash infusion. Otherwise, its costs will be higher than those of the company, for it must include a profit as well as sales and marketing costs in its budget—an internal department does not have to earn a profit, nor does it have a sales force. Thus, there are a few situations in which a company can reduce its costs by outsourcing, but there are many more cases where this is not a realistic reason for outsourcing.
2. **Focus on core functions:** A company typically has a small number of functions that are key to its survival while other functions or activities are required to be done but are non-core. It may want to focus all of its energies on those functions and distribute all other functions among a group of suppliers who are capable of performing them well enough that the company management will not have to be bothered with any of the details associated with running them. The company may even want to outsource those functions that are core functions at the moment, but which are expected to become less important in the near future due to changes in the nature of the business. In addition, a company could even outsource a function that is considered key to the company's survival if it can find a supplier that can perform the function better—in short, only keep those functions that are core functions and which the company can

do better than any supplier. For example, a company may be the low cost manufacturer in its industry, which allows it to maintain a large enough, pricing advantage over its competitors, that it is guaranteed a large share of the market.

3. **Acquire new skills:** A company may find that its in-house skill set is inadequate for a given function. This is the most common reason and is used for outsourcing those functions that require high skill levels, such as engineering and computer services.
4. **Acquire better management:** A company may find that an in-house function is not performing as expected not because of any problem with the staff but because of inadequate management support or capability. Symptoms of this are high turnover, absenteeism, poor work products and missed deadlines. It can be very hard to obtain quality management, so outsourcing a function to a supplier just to gain access to the supplier's better management can be a viable option. It may also be possible to rent management from the supplier. This can be a good option in all functional areas, though it is more common in areas requiring high levels of expertise such as engineering.
5. **Assist a fast growth situation:** If a company is rapidly acquiring market share, the management team will be stretched to its limit, building the company up so that it can handle the vastly increased volume of business. In such situations, the management team will desperately need additional help in running the company. A supplier can step in and take over the function so that the management team can focus its attention on a smaller number of core activities. For example, a company in a high growth situation may outsource its customer support function to a supplier, who already has the phone line capacity and trained staff available to handle the deluge of incoming calls.
6. **Avoid labour problems:** If a company is constantly bogged down by labour problems which start affecting its productivity and performance, outsourcing becomes a viable option. Companies can in such cases use supplier's infrastructure, manpower and facilities for production and concentrate on marketing or getting business.
7. **Focus on strategy:** A company's managers typically spend the bulk of each day handling the detailed operations of their functional areas—the tactical aspects

of the job. By outsourcing a function while retaining the core management team, a company can give the tactical part of each manager's job to a supplier, which allows the management team to spend far more time in such strategy related issues as market positioning, new product development, acquisitions, and long-term financing issues.

8. **Avoid major investments:** A company may find that it has a function that is not as efficient as it could be, due to lack of investment in the function. If the company keeps the function in-house, it will eventually have to make a major investment in the function in order to modernize it. Outsourcing this function can avoid any major investments. For example, by outsourcing transportation activity, the company that owns an ageing transportation fleet can sell the fleet to a supplier, who then can provide an upgraded fleet to the company as part of its service.
9. **Handle overflow situations:** A company may find that there are times of the day or year when a function is overloaded for reasons that are beyond its control. In these situations it may be cost effective to retain a supplier to whom the excess work will be shunted when the in-house staff is unable to keep up with demand. This is a reasonable alternative to the less palatable option of overstaffing the in-house function in order to deal with overflow situations that may only occur a small percentage of time. This is a popular option for help desk services as well as customer support, where excess incoming calls are sent to the supplier instead of having customers wait on line for an excessively long time.
10. **Improve flexibility:** This is similar to using outsourcing to handle overflow situations, except that the supplier gets the entire function, not just the overflow business. When a function experiences extremely large swings in the volume of work it handles, it may be easier to eliminate the fixed cost of an internal staff and move the function to a supplier who will only be paid for the actual work done. This converts a fixed cost into variable cost—the price of the supplier's services will fluctuate directly with the transaction volume it handles.
11. **Improve ratios:** Some companies are so driven by their performance ratios that they will outsource functions solely to improve them. For example, outsourcing a function that involves transferring assets to the supplier will

increase the company's return on assets (which is one of the most important measurements for many companies). The functions most likely to improve this ratio are those heavy in assets, such as maintenance, manufacturing and computer services. Another ratio that can be improved is profitability per person. To enhance this, a company should outsource all functions involving large numbers of employees, such as manufacturing or sales.

12. **Jump on to the bandwagon:** A company may decide to outsource a function simply because everyone else is doing it, too. Also, a large amount of coverage of outsourcing in various national or industry specific publications will give company management the impression that outsourcing is the trend, and they must use it or fail. For example, due to the large amount of publicity surrounding some of the very large computer services outsourcing deals, the bandwagon effect has probably led to additional outsourcing deals for the computer services function.
13. **Enhance credibility:** A small company can use outsourcing as a marketing tool. It can tell potential customers the names of its suppliers, implying that since its functions are being maintained by such well-known suppliers, the company's customers can be assured of a high degree of quality service. In these instances, the company will want to hire the best known suppliers, since it wants to draw off of their prestige. Also, for key functions, the company may even want to team up with a supplier to make joint presentations to company customers, since having the suppliers staff present gives the company additional credibility.
14. **Maintain old functions:** A company may find that its in-house staff is unable to maintain its existing functions, while transitioning to new technology or to a new location. Outsourcing is a good solution here, for it allows the company to focus its efforts on implementing new initiatives while the supplier maintains existing day-to-day functions. This reason is most common in computer services, where suppliers are hired to maintain old 'legacy' systems while the in-house staff works on transitions to an entirely new computer system.
15. **Improve performance:** A company may find that it has a function that has bloated costs or inadequate performance. To shake up the function, company management can put the function out to bid and include the internal

function's staff in the bidding process. The internal staff can then submit a bid alongside outside suppliers that commits it to specific service levels and costs. If the bid proves to be competitive, management can keep the function in-house, but hold the function's staff to the specific cost and performance levels noted in its bid. As long as suppliers are told upfront that the internal staff will be bidding and that the selection will be a fair process, they should not have a problem with this type of competition. This approach can be used for any functional area.

16. **Begin a strategic initiative:** A company's management may declare complete company reorganization and outsourcing can be used to put an exclamation point on its determination to really change the current situation. By making such a significant move at the start of the reorganization, employees will know that management is serious about the changes and will be more likely to assist in making the transition to the new company structure.

Usually one of the above reasons dictates an outsourcing decision. But before finally taking the plunge, company should exhaustively evaluate the working and functioning of the department/function concerned. Many a time there is a deeper problem where the function in question is not doing a good job of presenting its benefits to management. In such a case, the function manager may not be able to showcase its accomplishments, or showing management that the cost of keeping the function in-house is more favourable.

If the management suspects that this may be the reason why outsourcing is being considered, it is useful to bring in a consultant who can review the performance of the in-house employees and see if they are, in fact doing a better job than they are saying. Sometimes investigating the ability of in-house staff prior to outsourcing functions will keep the outsourcing from occurring.

The manager who is making the outsourcing decision should also consider that it is not necessary to outsource an entire functional area—instead the manager can cherry pick only those tasks within the function that are clearly worthy of being outsourced and keep all other tasks inhouse. This reduces the risk to the company of having the chosen supplier do a bad job of handling its assigned tasks, since fewer tasks are at risk, and it allows the company to hand over the remaining functional tasks to the supplier as it becomes more comfortable with the supplier's

performance. For example, a company can outsource just the maintenance of its computer services function, or it may add network services, telephone services, application development, or data centre operations task to one or more suppliers. These options are all available to the manager who is edging into a decision to outsource.

The typical path that a company follows starts with a function that has minimum strategic value and will not present a problem even if the supplier does a poor job of providing the service. If the company's experience with these low-end functions prove successful, then company management will be more likely to advance to outsourcing those functions with more strategic value or with more company threatening consequences, if the provided service is inadequate. These functions include accounting, HR and materials management. Finally, if the company continues to perform well with all or part of these functions; typically these are manufacturing, computer services and engineering (though this may vary by industry). Only by considering the reasons in favour of outsourcing alongside the associated risks can a manager arrive at a considered decision to outsource a function.

OUTSOURCING RISKS

These can range from pricing issues to nonperformance by a supplier of a key function. The person making the outsourcing decision must be aware of these risks before making the decision to hand over a function to a supplier. Broadly, these risks can be classified into short-term risks and long-term risks. Companies indulging in outsourcing have to guard against both of these risks. Short-term risks can include among others operational issues at supplier's end, while long-term risks can be nonalignment of company's goals with supplier's goals in the long term.

Supplier's situation may change in the future, causing problems in the outsourcing relationship. For example, the supplier may have financial difficulties, be bought out by a company that does not want to be in the outsourcing business, or undergo a shift in strategy that forces it to provide different services. Also, the technology needed to service the company's needs may change over time and the supplier may no longer be able to service that new technology. These risks can be lowered by ensuring that there is a termination clause in the outsourcing contract

that allows the company to back out of the contract if any of the above circumstances occur. Also, these risks are less important if there is a large number of competing suppliers to whom the business can be shifted. Alternatively, the risk is greater if there are few competing suppliers to whom the company's business can be shifted. Supplier's inability to grow in the same proportion as the company, can be another big risk. But this is a long-term risk and can be gauged and understood beforehand.

OUTSOURCING PROCESS

1. Understanding company goals and objectives

Outsourcing decisions have to be taken within the framework of a company's goals and objectives. Both the short-term goals and long-term strategies have to be considered, understood and acted upon. Outsourcing suppliers also have to appreciate these goals and functions accordingly.

2. A strategic vision and plan

Drafting an outsourcing vision and plan is the next important step. Once again, this plan has to be both long-term and short-term. Long-term plan can contain the overall company's policy towards outsourcing in general, clarity on the functions, activities to be outsourced, etc. while the short-term plan contains an immediate plan of action.

3. Selecting the right vendor

This is one of the most vital and important activities. It is also a long-drawn out activity which should involve activities such as collecting supplier intelligence, collecting supplier background information, evaluation of this information, etc. Vendor's attitude, his growth potential, past performance, etc. need to be evaluated.

4. Management of the relationships

Relationship management is an extremely important task in outsourcing. The more one indulges in outsourcing, the more relationships one has to manage. Hence it is essential to have a structured method of managing the relationships.

5. A properly structured contract

Structuring an outsourcing contract is both an art and a science. This contract needs to have all the necessary clauses, scope for growth, scope for incentives and all other clauses built into it. This contract will be the main document that will govern the relationship.

6. Open communication

When the company takes outsourcing-related decisions for the first time, it is always one of the activity/function initially done internally. This either causes closure of an internal function/activity or pruning it substantially. Hence this action displaces an internal group and can cause a lot of unrest within the company. Therefore, handling this situation effectively is also a part of an outsourcing process. This is applicable even for situations where the company decides to increase outsourcing or outsource some other activity/function.

7. Senior executive support

This is essential initially to garner support for outsourcing. Also inputs from these senior executives can be helpful for drafting the contract.

8. Use of outside expertise

It is sometimes essential to involve an outside consultant to help the company through the process, especially when the company is doing it for the first time. This person should be an expert in outsourcing and should have adequate experience in drafting the outsourcing contract.

OUTSOURCING IN SCM

Outsourcing logistics has been a favourite with companies since several years. It is only recently that companies have started thinking about outsourcing other aspects of SCM.

Despite the wide acceptance of outsourcing logistics functions, a variety of organizational concerns inhibit the outsourcing of logistics processes, including:

1. **Fear of losing control.** Companies are hesitant to hand over important logistics processes to a third party. As the third party might also be managing the logistics processes of competitors, companies are afraid that trade secrets might be misused, mismanaged, or lost—or in the worst case, pass through the third-party provider into the hands of competitors.
2. **Lack of confidence.** Compounding the fear of loss of control is the lack of confidence companies feel about the ability of third-party providers to meet their needs.
3. **Lack of outsourcing education.** Many companies are familiar with outsourcing, in terms of the IT and business-process enhancements that logistics service providers can offer. However, they lack a thorough understanding of the experience of managing the outsourcing service provider throughout the life of the relationship.
4. **Management philosophy and tradition.** Many companies simply resist change. They may reject the concept of outsourcing logistics activities due to a perceived potential negative effect on their business model and operations. In addition, these companies may have had poor outsourcing relationships in the past and may be less inclined to initiate new outsourcing contracts. Furthermore, they may believe that the geographical separation between them and their outsourcer could cause service management issues.

For example, some companies feel that an outsourcer may not be sensitized to the unique logistics needs of their product lines. Others feel that outsourcers are not equipped to deal with dynamic or mission-critical operations. Due to this lack of confidence, companies are cautious about getting locked into a long-term contract with an outsourcer and are concerned about the associated legal fees and penalties that would be incurred if disputes arose.

LEAN COMPANIES: NEW OPPORTUNITIES IN SCM OUTSOURCING

In today's global economy, companies are making their best attempt at shedding their flab and becoming lean and trim. This new avatar can ensure a faster

response, agility and better ability to handle pressure. These companies often find it much more cost effective to outsource rather than build a proprietary infrastructure. They believe in having no production facility, no warehouse, no loading dock, no boardroom—just office space, a handful of employees, and a great idea for a product or service and marketing strength.

In this case, outsourcing SCM can ensure that the entire necessary infrastructure is in place, without actually having to spend on any infrastructure. This can save a lot of working capital from getting locked. Moreover, companies can then focus on core activity of getting the customers and servicing them efficiently.

Through the use of outsourced services, enterprises can avoid all or some of the costs associated with physical plant, specialized IT systems and equipment, telephone lines and bodies—and best of all—no distractions from the carrying out of their core competencies. Especially young companies or new companies should not waste their time focusing on building these operational infrastructures when their primary business is to create and sell products and services—and not managing supply chain activities.

SEVEN MYTHS OF SUPPLY CHAIN OUTSOURCING

These seven myths can help manufacturers realize the original vision of this option.

Myth 1: My outsourced partners are all supply chain experts.

The reality is that they know very little about your (or anyone else's) supply chain. What they are experts in is producing the maximum volume of product at the minimum cost. Doing this does not require much visibility into their supply chains; it requires focusing on their internal business processes. The old saying of 'garbage in, garbage out' applies here. The best partner in the world will do a great job of building perfectly to specifications and delivering on time a product that never has and never will work. It's your responsibility to ensure that your outsourcing partner knows your current specifications (not those planned three to six months ago, which may now be obsolete), and that you have real time, web-based access to their work in progress and bills of materials. Only through such

oversight, can you enable your outsourced partners to produce as though they actually were supply chain experts.

Myth 2: My partners have state-of-the-art information technology (IT) infrastructures.

You may assume that your outsourcing provider has a fully automated system and end-to-end electronic data interchange or web-based links with its suppliers. Unfortunately, this assumption is not grounded in reality. The reason is that most outsourcers have net profit margins in the 2 per cent to 4 per cent range, and any cost centre that does not directly relate to product quality becomes a candidate for the 'budget axe'. Consequently, new investments in IT infrastructures are about as common as ice storms in the Sahara. Instead, legacy systems that predate the Internet and that lack supply chain-specific functionality are common. When you choose an outsourcing provider, your challenge is to provide him with a way to access integratable state-of-the-art supply chain systems without his having to invest a penny in the procurement of those systems.

Myth 3: By outsourcing production and fulfilment, I will not have to worry about execution.

The issue here is that you, and you alone, are responsible for the ultimate execution of your project and delivery of your products. Outsourcing is a means to an end, and your ends are necessarily different from those to whom you outsource. Consider that multiple subsets of unfinished goods generally comprise finished goods. Each unfinished good has a particular process, timetable, set of inefficiencies and potential obstacles. The result is that the acceptance of an order can be followed by missteps and missed deadlines by a variety of third parties, and any of these problems can cause serious problems with manufacturing and fulfilment. It has been said that when everyone is in charge, no one is in charge, and the proliferation of these third parties makes that aphorism a reality. Therefore, you must take direct responsibility for end-to-end execution or suffer the consequences.

Myth 4: My outsourced partners will provide expert project management.

It is better to view these partners as renegade divisions of your company. They may get the job done, but they will do it their way, with their own processes and

without an interest in integrating their data with yours. How can you reconcile these apparent conflicts of interest? First, you must recognize that your outsourcing partners would not be in business unless they had many other customers' demands to satisfy, many other deadlines to meet, and a high attention to cost containment.

Second, you should understand that your partners will be, by the nature of their businesses, paying attention only to that small portion of the manufacturing/fulfilment process with which they are concerned—not to the entire supply chain, which must be your concern. Ultimately, you must accept that outsourcing and retaining control of your supply chain network are complementary, not antagonistic, activities.

Myth 5: Outsourcing automatically gives me a time-to-market advantage.

In many cases, this myth is the most compelling driver of an outsourcing policy. But unless you carefully select your partners, provide them with integrated access to your supply chain systems, and enable your company to supervise the relevant projects, it will be your more nimble competitors who will realize the advantage. Why? Because contract manufacturers' processes and systems have been designed for mass production, not for mass customization and weekly new product introductions. It is easy to say that you should select your outsourced partners based on their demonstrated commitment to fast-paced manufacturing environments. It is easy to suggest that your partners should implement strict management oversight and control mechanisms to ensure that their subcontractors respond rapidly to fast-changing deadlines.

The reality is that these bromides should not and cannot substitute for your *enabling* your partners by providing them with cost-free access to a real-time, web-enabled, collaborative software platform that instantaneously shares and distributes management, scheduling and other data to all relevant parties. This is how to gain a real time-to-market advantage over your competitors, who will still be relying on their partners to shoulder such unwanted burdens.

Myth 6: Outsourcing is the key to making my operations highly scalable.

Vertically integrated companies have to scale linearly, not exponentially. Real estate and labour pools inherently grow in a linear fashion. Exponential growth,

on the other hand, arises only from leveraging the efforts of multiple contractors, who in turn leverage other contractors. Outsourcing is then, in principle, a direct application of the network effect.

But if you lose control of your supply chain network, outsourcing may introduce interminable delays instead of exponential growth. Specifically, at each step along your supply chain, you need to make decisions. Some of these decisions can be automated, while others require the intervention of individuals with domain-specific knowledge. If you lack information about your outsourcing partners' activities and visibility into their supply chain networks, these will together prevent decisions from being made quickly and often prevent them from being made at all.

Again, only by offering and requiring your partners to collaborate in real time with you (at no IT cost to them), can you achieve the scalability that outsourcing promises.

Myth 7: Fulfilment is easier to outsource than manufacturing.

Fulfilment companies, like manufacturers, have to optimize their cost structures. These firms are, therefore, also reluctant to invest in IT systems that would optimize the management of inventory and accelerate their own supply chains. Moreover, because fulfilment firms typically pass on their costs to their customers, there is, in the short term, no market imperative for such firms to become more efficient.

But there are strategies that you can employ that will deliver meaningful benefits to your fulfilment partners and that will enable you to capture the business of the best of these partners. Specifically, you can deploy a system that automates the replenishment of stock prior to the occurrence of a product shortage. The benefit to your partner will be direct and compelling: lower inventory carrying costs. The benefit to you will be that you can now gain from the outsourcing of fulfilment the same advantages as you would from the outsourcing of manufacturing.

REALIZING THE PROMISE OF OUTSOURCING

Intelligent outsourcing—outsourcing based on the reality of your contractors' businesses, not on your hopes, and outsourcing in which you confidently provide

executive control of the supply chain network to your less technology-enabled partners—will make your company much more competitive and responsive to market trends. By reclaiming your management responsibility through the deployment of a secure, collaborative, real-time platform, you can operate your outsourced supply chain as though it were a single enterprise of divisions within your company. Today's dynamic markets are characterized by short product cycles and constant innovation and, through your adoption of such myth-shattering outsourcing models and technologies, your company can truly thrive in the new economy.

(Reproduced with permission from an article written on the same topic by Reynaldo Gil who is an expert in supply chain software with experience in several industries. He is also the founder and chairman of World Chain Inc., a provider of enabling software for trading partner collaboration.)

OUTSOURCING FIASCOS

When companies start to consider the setting up of an outsourcing strategy they often run into a string of problems, they either failed to consider or did not consider deeply enough. Following is a look at some of the most significant of these factors.

THE CHANGEOVER

A major issue facing companies considering the adoption of an outsourcing strategy is how to transition business from inside providers to outside suppliers on a seamless basis. When a company takes important business functions and puts them in the hands of outside providers, how does it continue to effectively manage the functions from a long-range strategic point of view? This need for successful long-range transition is of primary importance whether what is outsourced involves research, development or manufacturing.

NEED FOR EFFECTIVE UNDERSTANDING OF CORE COMPETENCIES

What many fail to understand is that outsourcing is a major strategy issue and there is a really significant need for deep sourcing insight into its nuances.

Understanding must be developed from the standpoint of comparing internal organizational core competencies with what else may be available from outside sources. In some cases, it may also be desirable to have a strategy that promotes a core competency inside the organization while promoting a parallel competency with an outside organization. The point is that effective outsourcing is not just adopted. In most cases it needs to be shaped for specific companies with specific competitive needs.

NEED TO MANAGE

An especially important consideration for many companies is their need to manage outsourcing. They fail to understand that by merely replacing the in-house manufacturing of an item with an outsourced item does not replace the need to manage the outside supplier. Indeed, a company's core competency continues to be a major consideration even after an outsourcing agreement is put into place. A company that has a supplier doing work for it on a licensed basis, for instance, still needs to make sure that the supplier's core competency is being developed over the period of the contract. It is often felt that the supplier's core competency becomes a greater concern over time, as new products and product features are added by the customer company.

COMPLEXITY

As outsourcing is increasing along with executive management's stirrings in the direction of outsourcing, has come the strategy's growing complexity. In recent years, for instance, outsourcing strategies have evolved from simple forms of contract manufacturing to strategies that encompass sizable teams of key people on the technology and commercial as well as the manufacturing sides of the business working together to develop comprehensive strategies.

WHAT'S AT THE CORE

More and more often as new competitors come into play, organizations are finding it necessary to re-define their core competencies. At the centre of this soul searching about products and process technologies are a number of outsourcing

decisions. Where only a few years ago most outsourcing decisions were driven by such tactical considerations as the need to add capacity, decisions these days are being driven more often by longer range goals of better capital utilization. Executive managers are examining organizational capabilities in their worldwide supply bases and what needs to be developed to compete effectively.

MEASUREMENT

Another issue usually overlooked are the metrics needed to measure the effectiveness of the outsourcing strategies used. New measures need to be developed to drive the new strategies and to drive competitive advantage. Historically, sourcing tended to be ignored when measurements were developed to track the effectiveness of supplier performance. Indeed, in many companies sourcing was not considered to be a particularly important factor in corporate strategizing and sourcing was generally viewed as a transactional activity at best. As a result, in today's business world, if sourcing decisions are going to be major contributors to corporate competitiveness, the measures that will need to be used may have to change. In many cases the transition may be bumpy. Measures used to determine the effectiveness of outsourcing strategies may have to vary over time from tactical, to transitional, to strategic in nature. Decisions affecting manufacturing, design, development, outsourcing will need to begin linking together around the metrics used to measure the outsourcing strategies. For example, new or changed metrics may need to be developed related to 'transitioning effectiveness' evolving from outsourcing decisions.

Drafting an outsourcing contract

1. Start all contracts with the companies' business objectives. Why is this process being outsourced? What are the components of the process to be outsourced?
2. Determine and align clear business objectives with the supplier's capabilities.
3. Employ internal and external benchmarking to determine current capabilities and costs to help the company set a baseline and refine business objectives.

4. Develop performance and cost targets to develop initiative (supplier).
5. Create and build initiative-based targets into the contract (both parties).
6. Fulfil the initiatives. The buyer achieves control over the outsourced process, accountability, cost savings and improved profitability and performance. The outsourcer achieves revenue growth, extra profit (depending on incentives) and possible contract extension or renewal. Both parties benefit from the relationship.
7. Review performance regularly (monthly, quarterly or annually) and mete out rewards or penalties to the supplier. Benchmarking also helps the company develop new business objectives.
8. Decide whether to expand or shrink the relationship with the outsourcer. Work together with the gathered information in the external benchmarking, evaluation and initiative creation stages to conduct scenario planning and develop new business objectives.

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CONCLUSION

According to Prahalad and Hamel (1990) core competencies are the fundamental strength of the company, which should be identified and cultivated in order to build new products and market opportunities. The basic idea is that outsourcing facilitates a focus on the resources and activities that are regarded as core competencies so that the management could focus on strategic business areas. According to Pfeffer and Sutton (2000), there are two main problems inherent in the outsourcing of production. First, the company loses an internal feedback mechanism to evaluate construction in terms of manufacturability, quality, failure and costs. Secondly, the effect of outsourcing could be a signal to the organisation that short-term profit is more essential than developing the competence of the employees. Quinn and Hilmer (1994) have pointed out three kinds of risks: the loss of internal competence, a reduced ability to control and the loss of cross-functional competence networks. Bryce and Useem (1998) mention that the new supplier may transfer the company's

knowledge to its competitors. Hendry (1995) argues that there are a number of hidden costs related to outsourcing. He means that outsourcing is mainly motivated by analysis of the formal side of the company, expressed in explicit value chains and business processes. The effects on infrastructure, values and informal co-operation, i.e. the informal side of the organization, are seldom examined. Based on this notion, Hendry formulates several balance problems that need to be scrutinized when outsourcing. One is about the balance between short-term efficiency and long-term learning, which depend on the informal organization. Another concerns the balance between focusing on core activities and paying attention to contextual changes, which relies on informal communication. Outsourcing is not only a transfer of knowledge but also a more complex transformation of knowledge. Conclusively, the literature indicates that outsourcing incorporates several difficult balance problems. These concern the dependency between learning and the formal and informal aspects of the organization; the significance of having feedback mechanisms between market, development and production, which could vanish unless specific actions are taken; the dilemma of systemic company competence; and the difficulty of discerning core and non-core competencies in a dynamic context. The question is also whether manufacturing is a core activity or competence in engineering companies and whether manufacturing is a disposable subsystem or not. One basic balance problem seems to be that outsourcing may provide a company with the potential for knowledge creation by combination. An interesting research question is thus to decide the limits of outsourcing manufacturing that don't undermine the company's long-term capacity for development and renewal.

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Performance Measurement in SCM

“Not everything that can be counted counts, and not everything that counts can be counted.”

— *Albert Einstein.*

Paul Epstein, a noted author on performance measures has defined performance measures as “a systematic attempt to learn how responsive an [organization’s products and] services are to the needs of the [customer] and the [organization’s] ability to pay.” Businesses and companies exist to satisfy the customers and make a profit in the process. Measuring performance offers an effective method of determining whether or not an organization is meeting its goals and achieving its mission.

In the process of satisfying customers, companies have to indulge in several activities such as buying goods and services from other companies, manufacturing the finished product using these raw materials and finally the process of delivering this end product to the customer. Unless each of these activities are performed with precision, business cannot achieve its goals thereby justifying its reasons for existence.

Measuring inputs: Inputs are the resources that an organization uses to produce goods or services, including human, financial, facility, or material resources.



Figure 13.1 Performance measurement in supply chain management

Hence measuring inputs means measuring all those activities linked to these inputs. This includes suppliers performance, i.e. how timely they supply, quality of the material, etc.

Managing processes: Processes are the various activities that the businesses indulge in to convert these inputs into customer desired outputs. This includes inventory control, manufacturing, storekeeping, packaging and all of those activities that are required to make customer desired finished products. Performance measurement of these processes include stock turnover, inventory ratio, manufacturing capacity utilization, adherence to schedules, etc.

Output measures: These are tools, or indicators, to count the services and goods produced by an organization. The number of people receiving a service or the number of services delivered is often used as measures of output. This also assesses the actual impact of an organization's actions. An outcome measure is a means for quantified comparison between the actual result and the intended result.

Efficiency measures: There are indicators that measure the cost, unit cost or productivity associated with a given outcome or output.

ADVANTAGES OF PERFORMANCE MEASURES (METRICS)

The accounting firm of Price Waterhouse has offered three main reasons for establishing metrics in an organization.

1. **Measurement clarifies and focuses long-term goals and strategic objectives.** Performance measurement involves comparing actual performance against expectations and setting up targets by which progress toward objectives can be measured.
2. **Measurement provides performance information to stakeholders.** Performance measures are the most effective method for communicating about the success of programmes and services. For example, in public education, states and districts schools routinely issue 'report cards' highlighting test score outcomes and other key indicators of educational performance. These have become centrepieces of attention among not only educators, but many other stakeholders.
3. **Measures encourage delegation rather than 'micro-management'.** Hierarchical structures and extensive oversight requirements can obstruct organizational effectiveness. Performance measures free senior executives for more strategic decision-making and selective intervention, while clarifying the responsibilities and authority of managers.

THE BENEFITS OF PERFORMANCE MEASUREMENT

1. **Performance measurement enhances decision making.** The process of developing performance measures allows an organization to determine its mission, set goals for desired results, and identify methods of measuring how well the results are achieved. The data generated through performance measurement can be utilized in determining programme effectiveness, in evaluating options for service delivery, and in charting long-term programmes and fiscal plans. For boards of directors, performance measures can focus attention on outcomes, and can allow for solid evaluation techniques.
2. **Performance measurement improves internal accountability.** Measuring performance gives decision makers a significant tool to achieve accountability. Employees at all levels are accountable to upper-level managers for their performance or that of their crew, and upper-level managers are accountable to executives. This relationship becomes much clearer when outcomes and outputs are measured by a commonly accepted standard. Systems such as

management by objectives (MBO) or pay for performance plans can be much more effective when teamed with a high quality measurement system.

3. **Performance measurement supports strategic planning and goal setting.** Without the ability to measure performance and progress, the process of developing strategic plans and goals is less meaningful. While there is clearly some benefit to thinking and planning strategically, the evaluation of such plans and goals cannot be objective without measuring performance and achievement. For example, one strategic initiative of secondary education might be to prepare non-college bound students to be effective in the labour market without higher education. If a high school were to set such a goal, and then not identify ways to determine how well prepared students were upon graduation, the school could not know how well its vocational programmes were meeting the objective.

Organizational metrics are important for all organizations—public, private and non-profit. Working with employees, management and affected stakeholders, organizations involved in strategic planning can develop measures of performance in the production of goods and services and in meeting the organization's most important objectives.

MEASURING SCM

The concept of operations at high-technology companies is changing. No longer does it apply simply to the manufacturing of products. Rather, it applies to the concept of managing a supply chain spanning from suppliers' suppliers to customers' customers.

As mentioned above, supply chain measurement encompasses three types of measurement criteria:

- Supplier performance
- Purchasing and materials management performance
- Supply chain performance

SUPPLIER PERFORMANCE MEASUREMENT

Supplier performance measurement is the process of measuring, analyzing and managing supplier performance for the purposes of reducing costs, mitigating risk and driving continuous improvements in value and operations.

Common and consistent measurements can help companies focus resources, identify performance glitches, develop strategies for supply chain improvements and determine the total cost of ownership (TCO) of supply relationships, products and entire supply chains.

Failure to accurately measure, evaluate and manage the performance of these partners can increase a company's costs, damage its product quality and hinder its competitiveness in the marketplace.

The authors conducted a survey on what Indian companies are doing and feeling about performance measurement. The survey questions ranged from whom to measure to how to measure and what is done with measured data, etc. With a sample size of 48 companies and what and how they measure performance, this survey can be called a representative of the popular sentiment in India. This survey has been inspired by a similar survey conducted by Aberdeen Group across US, Europe and Australian manufacturing companies.

PARAMETERS FOR CHOOSING WHICH SUPPLIERS TO MEASURE

A typical manufacturing company deals with several hundreds of suppliers who supply several thousands of material required to produce the customer-desired finished product. Though most of the companies desire to measure each one of their suppliers, it does not actually happen due to sheer magnitude and size of the effort involved. Several companies used different parameters and had their own reasons to justify their choice of parameters. However, a majority of the companies felt that the bigger the supplier, i.e. suppliers who supply a sizable portion of the materials required have to be measured. The survey revealed the following results:

Nature of product input defines the criticality of the product, i.e. how important the product is for the company and the business and what effect its nonavailability or

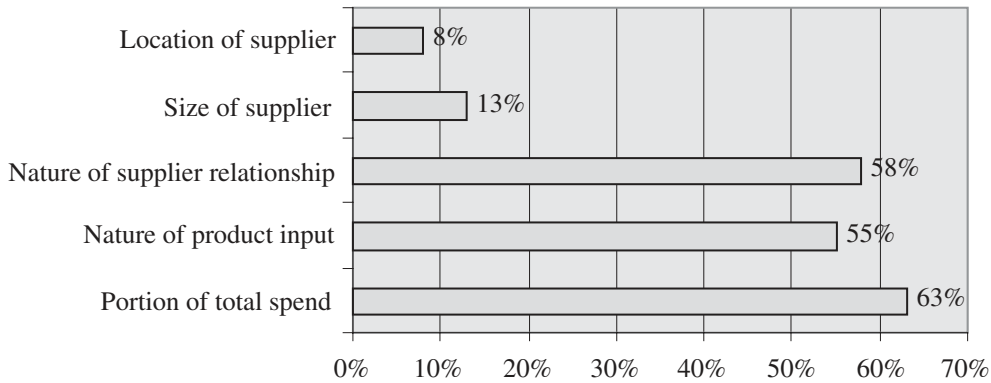


Figure 13.2 Choosing suppliers for measurement

some other problems will have on the business. Hence supply of this product has to be measured. Nature of supply relationship means the bond suppliers share with the company. More distant the relationship more is the need to measure the supplier. Though all the companies corroborated that every supplier needs to be measured, however the frequency and degree can be a function of the affinity with the supplier.

Location of the supplier was not considered to be an important parameter to choose a supplier to measure. Though, logically, farther the supplier, more the necessity to measure him, companies did not think so.

WHAT TO MEASURE?

After choosing which supplier to measure, it is important to choose the parameters on the basis of which, supplier will be measured. Surprisingly, quality emerged as a non-issue and all the participants in the survey felt that quality needs to be more or less assumed. Also, several companies choose suppliers on the basis of a thorough analysis of their ability to deliver quality. Hence, for regular and routine performance measurement, quality ceased to be a criterion.

Initiative was rated as one of the top criteria which indicates that more and more companies want suppliers who have an ability to demonstrate enterprise in all their dealings with the company. Since the supplier is the only person who knows the product that he is supplying in and out, he is the best person to suggest any

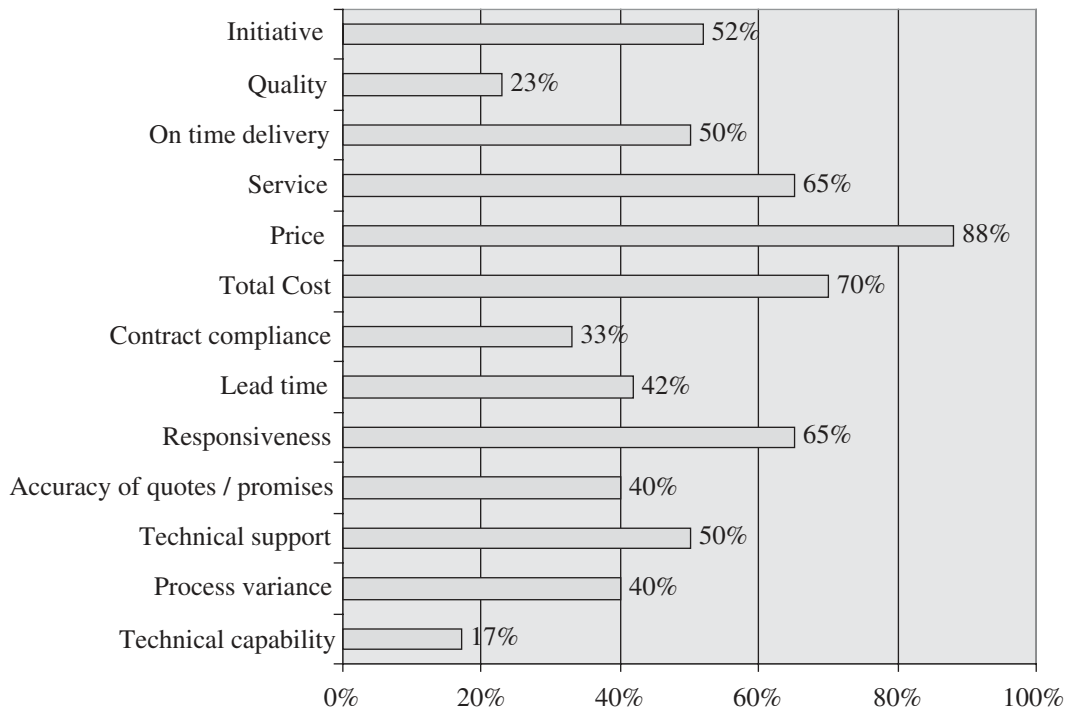


Figure 13.3 Various parameters for measurement

positive changes about the product. Be it regarding cost/price or value engineering or any other aspect related to product or service, companies are constantly endeavouring to improve and achieve excellence and they appreciate a supplier who can partner with them and contribute effectively. However, price and cost are still the topmost on the agenda of Indian companies. Service is also an important criterion used by companies to grade their suppliers. Technical capability once again, like quality is not considered to be so important as companies feel that this is also a pre-evaluated criterion and companies, to a large extent, choose suppliers only if they have the necessary and required technical capability.

After evaluating the suppliers, the next task was to draw valid conclusions from the data. What do the companies do with the information obtained from performance evaluation?

The suppliers whose score was above 95 per cent, was given the status of a preferred supplier, while those below that but above 75 per cent were termed as

Score	Status
95+	Preferred
75–95	Acceptable
Below 75	Corrective

acceptable suppliers. However, suppliers who scored below 75 per cent needed correction. All the companies had their own ways and methods of handling suppliers who fall either in category II or category III. For some of the companies there were only two categories: preferred or not acceptable, while some others had more than three categories.

Uses of performance data: After evaluating the suppliers and categorizing them into various categories, the next task was to use this data and information obtained thereof in the best possible manner so that everybody benefits from this exercise.

While a large majority of the companies shared this data internally with all the departments and functions, only 51 per cent of the companies believed in sharing this data with their suppliers. Also, while the majority of the suppliers used this data to evaluate suppliers for future business prospects, an equally impressive number of companies use this data to find supplier improvement opportunities.

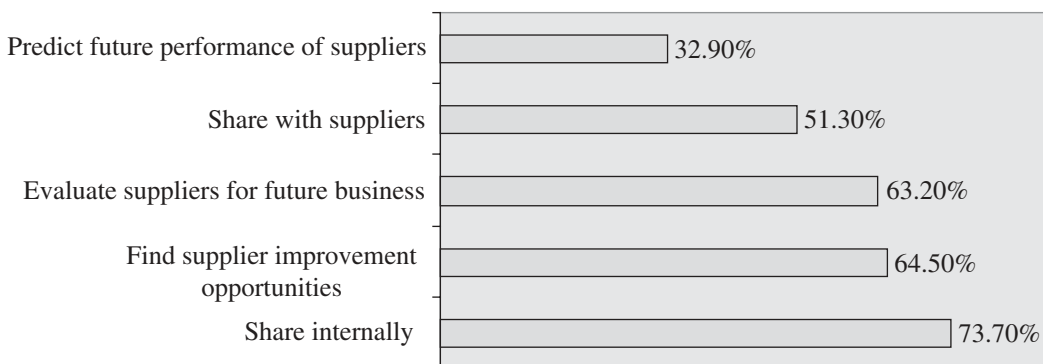


Figure 13.4 Various uses of supplier performance data

The obvious next question is whether sharing this data with the supplier provides any positive developments. Close to 83 per cent of the people who share the performance data with their suppliers felt that suppliers were highly reciprocal towards this information and they immediately made attempts to bring in company desired changes.

To the question whether the companies were using any available performance measure or whether they had got one made for them, a majority had designed their own software as they felt that their criteria and requirements could be met more aptly by this.

CONCLUSION

American war hero General George S. Patton had once remarked “If a man does his best, what else is there?” This statement has so much wisdom hidden in it and holds true for all the activities we perform. No performance measure, however stringent it might be, can create a problem for the supplier if he is doing all the right things, the right way for the right cause.

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HOME PAGE

SCM BOOK

Case Studies

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Authors

Welcome to the first edition of “Supply Chain Management”, a resource compiled and created to provide you with all the information necessary to get updated on the emerging area of management practice.

Supply Chain Management (SCM) is one revolution that has the capacity to challenge all the norms and practices industries and businesses followed so far. From Strategy to Operations, from Internal operations to external operations, from the manner in which information is managed to the manner in which decisions are taken – SCM has touched each area of business. From Automotive to FMCG, from Pharmaceutical to Chemical – SCM has brought in revolution in each type of industries and businesses.

This has generated tremendous curiosity and desire to know more and more about SCM. This book aims to do just that – its vision is to become the starting point for fuelling all ambitions to seek knowledge on SCM. We want this book to be a practical resource for all doubts and problems related to SCM.

FEEDBACK

A lot of effort has gone into putting this book together. We however apologize for glitches, misses if any. We would hence appreciate your feedback. Please send us a mail on sarika100@vsnl.net .

SCM BOOK

The book has been created at two levels:

- 1) **Conceptual Level:** This covers information on the basic tools and philosophies of SCM in an easy to understand manner.
- 2) **Practical Level:** SCM is an operationally intensive area and hence any resource that does not talk about how SCM is actually implemented or used is incomplete. This book covers six case studies from some of the leading companies of India who are pioneers in adapting SCM practices. Each of the case studies covers the challenges faced by these companies while implementing SCM, the problems and the solutions they found, the issues and opportunities, etc. We hope you find them interesting and encouraging.

CHAPTER SCHEME

The book is organized in thirteen chapters, each of which represents a facet of SCM.

*Chapter One, **SCM Concepts:*** Covers the basic fundamentals that prepare the groundwork to take-off. Definition of SCM, constituents of SCM, types of SCM, process for implementing SCM, IT applications in SCM etc. are some of the key take aways.

*Chapter Two, **SCM in the corporate context:*** Importance of SCM for businesses, evolution of the theory and philosophy of SCM, overview of the various thinkers and management gurus who have contributed towards the development of thinking on SCM etc. are some of the topics covered in this chapter.

*Chapter Three, **Achieving excellence in SCM:*** SCM excellence, various dimensions of SCM excellence, checklist for excellence etc. are some of the features of this chapter.

Case Study on FES (Farm Equipment Sector) of M&M has been covered here.

*Chapter Four, **Innovative SCM:*** This chapter harps on the importance of innovation in achieving success. Innovation in SCM and various aspects of this innovation has been covered here.

A Case Study on (GCMMF) Amul has been covered here.

Chapter Five, Customer focused SCM: Customer revolution and its effect on SCM, Concept of Demand chain and emergence of Value Chain Customer Relationship Management (CRM) and its integration with SCM are some of the topics discussed in this chapter.

Case Study on Asian Paints India Limited and their customer facing SCM practices have been covered along with this chapter.

Chapter Six, Retail SCM: Issues in Retail SCM, Bar Code technology and its role in Retail SCM, Types of Retailers, Product Life Cycle Management and the concepts like mass customization, de-verticalisation etc are the key take aways.

Marico case study accompanies this chapter.

Chapter Seven, Vendor Partnerships: Changing supplier management practices, supplier development, key supplier account management, supplier performance measurement, etc. have been covered in this chapter.

A Case Study on M&M Automotive Sector has been covered here.

Chapter Eight, Reliability and Quality Management: Reliability Engineering and its advantages, Total Preventive Maintenance etc. are some of the key take aways of this chapter.

A Case Study of Asian Paints with a focus on its Reliability Management programme has been covered with this chapter.

Chapter Nine: Information Technology for SCM: This chapter focuses on topics such as Bull whip effect, Business Process Re-engineering, Enterprise Resource Planning, Internet and its application in SCM, etc.

An Annexure on Emerging technologies of Electronic Commerce and its impact on SCM in particular and Business in general accompanies this chapter.

Chapter Ten: E-Purchasing for SCM: E-Sourcing, Implementing E-Sourcing, E-Procurement and the various tools of E-Procurement are covered here.

An annexure that demonstrates e-procurement opportunity has been provided along with this chapter.

Chapter Eleven: Logistics Management: History and Evolution of Logistics Management, Framework of Logistics Management, Elements of Logistics Management, Information Technology in Logistics Management are some of the key take aways.

A Paper on Services provided by Logistics Providers accompanies this chapter.

Chapter Twelve, Outsourcing in SCM: Background on Outsourcing and opportunities for outsourcing in SCM have been covered in this chapter.

Chapter Thirteen, Performance Measurement in SCM: Advantages of performance measurement, measuring suppliers, measuring self, etc. are some of the topics covered in this chapter.

CASE STUDIES

Snapshot of Case Studies covered in the Book

M&M (Mahindra & Mahindra) has time and again proved its capability to adopt best practices and their by beat the competition. The kind of work Automotive Sector of M&M has done in vendor relationship is astounding and worth emulating. Similarly, GCMMF (Gujarat Cooperative Milk Marketing Federation) or AMUL, as it is more fondly known as, operate in a very peculiar market where both the raw material (milk) and the finished product (milk products) are perishable in nature. Also the cooperative culture which encourages micro entrepreneurship among farmers is highly creditable. Innovation is the key for AMUL. And it is because of such innovative culture that encourage adaptation of best practices, AMUL has become one of the most respected companies in India. Marico Industries Limited (MIL) can be credited as one of the fastest growing companies in India. In just 14 years (MIL started operations in 1990) it has an overwhelming presence in the high pressure FMCG (Fast Moving Consumer Goods) sector. High pressure because, customer revolution has most hit the FMCG sector and with large number of branded and non-branded players it is highly competitive as well. And in such circumstances, the achievements of Marico are commendable. Asian Paints is another giant, who by its pioneering practices in SCM, in reliability management have dwarfed everybody else.

Operating in a seasonal market brings with it different challenges and problems. But, for Asian Paints creativity is the key to overcome such situations and market characteristics. Their approach to problems and issues, the methods they have adopted to overcome such issues and the manner in which SCM has been implemented are worth following.

About the Authors

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Sarika Kulkarni is a writer, consultant and management trainer in the area of Supply Chain Management, Logistics Management and Business Process Outsourcing. She has a Doctorate in Materials Management and has written several articles and research papers in various leading journals and magazines. She was associated with the prestigious Jamanalal Bajaj Institute of Management Studies as a researcher and faculty till 2001 after which she decided to pursue writing and training as her full time occupation.

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Ashok Sharma is the Managing Director of 5M India, a management consulting firm, based in Mumbai. The activities of the firm include consulting in different areas of Management especially Logistics and Supply Chain Management. He is a UN Trained and certified expert in teaching and training. He is a regular speaker at various National and International platforms. He has held several respectable positions in the past which includes that of President of BMA (Bombay Management Association), President of IIMM (Indian Institute of Materials Management) and also the President of IFPMM (International Federation of Purchasing and Materials Management).

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