

# Important Issues in Supply Chain Management and Development

Siddharth Choudhary<sup>1</sup>, Swadhin Kumar Nayak<sup>2</sup>, Abhimanyu Malik<sup>3</sup>, D.K. Singh<sup>4</sup>

<sup>1234</sup>Division of M.P.A.E , Netaji Subhas Institute of Technology(N.S.I.T) , University of Delhi, Azad Hind Fauz Marg, Sector 3,Dwarka, New Delhi-110078, India.

## Abstract:

**Objectives:** Understand the issues in Supply chain designs and to create and develop an Efficient and Responsive supply chain network.

**Results:** Since its inception by management stalwarts in the early 1980's Supply chain focus lies with the integration of various activities and processes both within and between organizations. The generic conceptualization of the 'Supply chain' is concerned much of the ways throughout business is an upshot of fragmented /disintegrated supply chain configurations. Nevertheless there exists enough evidence to support the notion that higher levels of achievement of intra and inter firm integration presents an array of managerial hurdles. The need for innovation is the call of today's robust SCM. Given the pivotal role played by supplier within SCM, any meaning innovation must concentrate heavily on this issue. This research outlines some of the hurdles and challenges encountered by existing supply chain in business context. It goes on to relate Supplier significance in Supply chain by the widely cited Kraljic's Matrix (Harvard business 1983).The core of this study gives a detailed account of supply chain management based on wide variety of literature. It does so with certain reference to the obstacles in having in implementing and integrated chain of business paradigm with a view of identifying the range of possible innovative and robust solutions. The adoption of more complex and integrated Supply Chain poses questions regarding the nature of customer/supplier relationship both internally and externally .The efficient and effective management of such relationships is, hence given peculiar focus.

**Applications:** developing an efficient and responsive supply chain, reducing bullwhip effect.

**Keywords:** supply chain, logistics management, e-SCM, traditional and modern supply chain, forecasting.

## I. INTRODUCTION

Christopher once called this era of supply chain competition. He stressed on result oriented supply chain over 'stand alone' entities. He emphasized on synchronization of efforts in differentiation to achieve and deliver the goods and services to the customer. It's hard to see organization in isolation because of excessive competition which accruing with time. In the contemporary times with advancement in the SCM and its ever increasing complexities has led to emphasis on reliability and consistency along with on

time delivery of desired goods and services to end users. (Christopher, 1998:28)

There are many definitions given for SCM [2-4]. But the one which outshines was given by Bernard J. Lalonde.

LaLonde, professor emeritus of Supply Chain Management at Ohio State University. LaLonde defines supply-chain management as follows: "The delivery of enhanced customer and economic value through synchronized management of the flow of physical goods and associated information from sourcing to consumption.

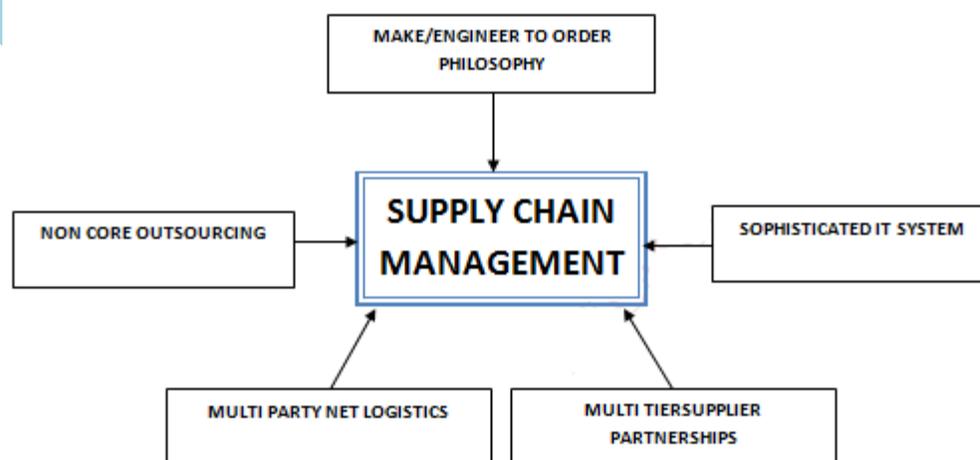


Fig 1: Modern Supply Chain[61]

Supply chain is the chain or series of processes involved right from production till its final delivery it also involves transformation of raw materials to sub assemblies and then into a finished

assembled product[5-7]. In general terms SCM means managing supply chain i.e. the management of goods and services from the raw materials suppliers at various tiers to the product delivery to

subsequent stages and finally to the end user. Within the organization the supply chain is related to wide spectrum of functional areas. SCM related activities like inbound transportation or lodging warehousing [14-18], inventory control[8-13,24], sourcing procuring[26-27] and supply

management, forecasting production planning[28-31] and scheduling , ordered processing[19-23] and customer services[25] forms integral part of SC umbrella. SCM includes all those activities that are related to the movement of goods from the raw materials stage through to the end user/customer.

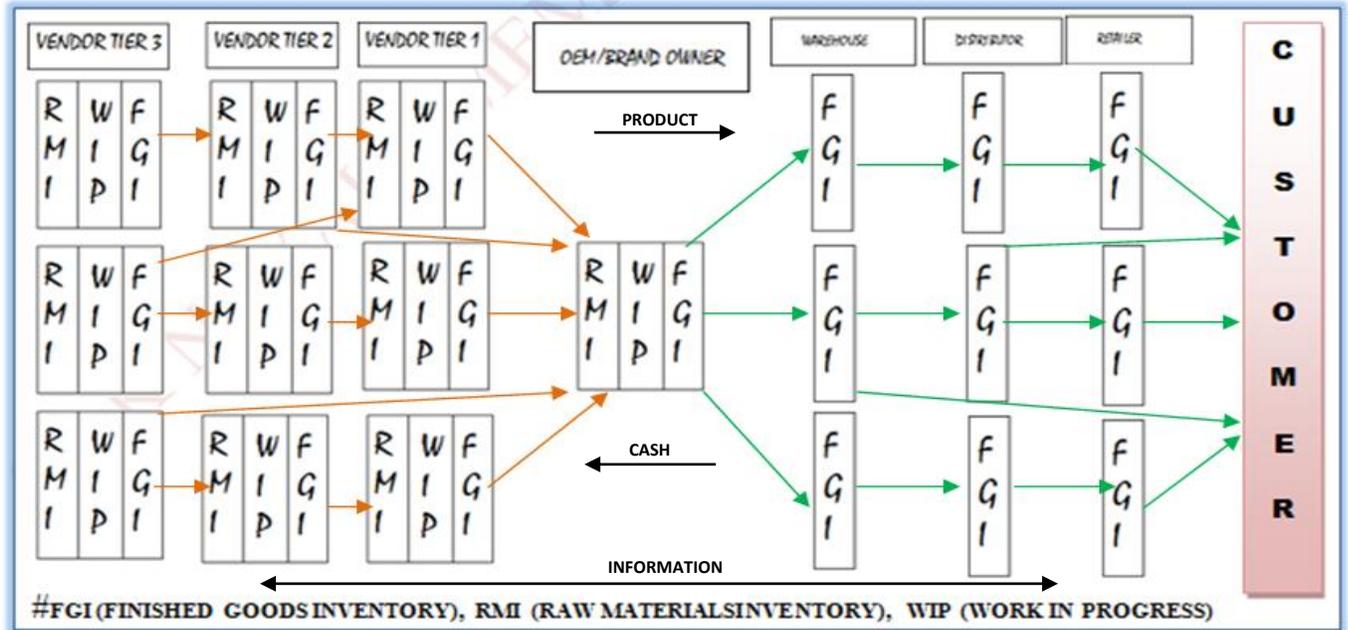


Fig 2: Supply Chain Management [62]

The above diagram gives us an overview of the supply chain in another mode of thinking. This diagram clearly shows the complexity of the various entities in the supply chain from the planning to the delivery of the product to the customers [32]. The management of the supply chain is very important as it is the essence to hold the whole supply chain so that it doesn't crumble like pastries. This mostly prevent the Bull-Whip effect.

The real achievement lies in realization of the future potential in SCM but integrating not only those entities which are present within the organization but also the external partners. The suppliers, distributors, carriers, customers and finally the consumers/end users are part of the external partners. All the central players are being termed as "extended supply chain" as per James E. Moorehouse of A.D.Kearney. They said, "The goal of the extended enterprise is to do a better job of serving the ultimate customer"



Fig 5: Supply Chain- iPhone [65]

Apple Inc. has a very elegant and competitive supply chain as compared to other Smartphone manufacturing companies. Apple does it tech work at California and manages everything from there. Being a MNC it manufactures its parts somewhere else and maintains a stringent quality parameter thereby

supplying World Class cutting edge technological wonders to its customers. Thus with every new product released in the market Apple Inc. manages its supply chain so elegantly that the product is well cared after and sent to its customers.

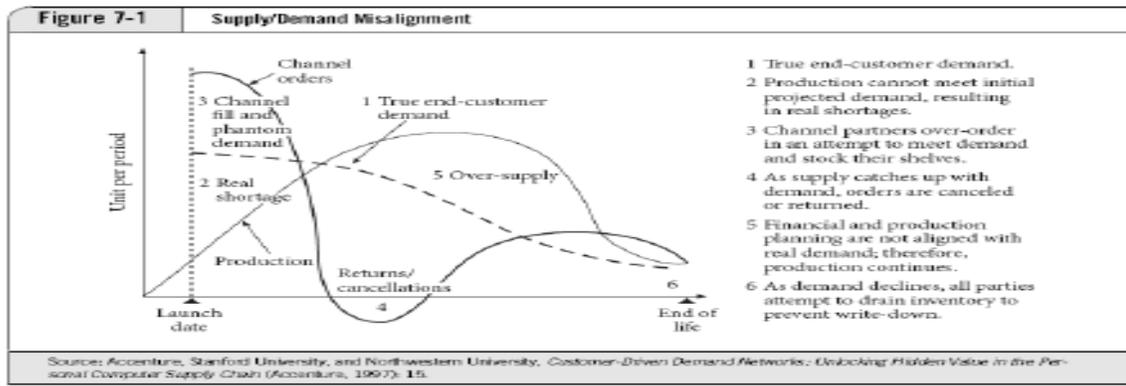


Fig 6: Integration trends [64]

Better service results in high market share. High market share, in turn gives competitive edge like lower warehousing and transportation cost reduced inventory levels less wastage and lower transaction costs [32-33]. The customer is the pivotal in quantification and communication of the supply chain value, as announced by Shrivawan Singh, VP of Integrated Supply Chain management at Xerox

If you can start measuring customer satisfaction associated with what a supply chain can do for a customer and also link customer satisfaction in terms of profit or revenue growth”, Singh further explains, “then you can attach customer values to profit and loss and to the balance sheet “.

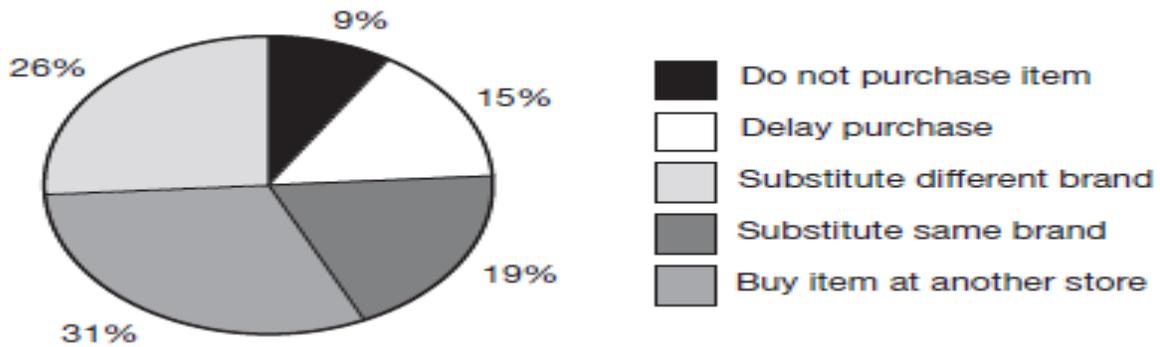
“Short term efficiency for long term competitiveness”.

SC development makes use of SCM proven methods and analytical tools to maximize the performance throughout the given supply chain to reap the benefits of systematic approach to SCM in terms of increased profits, ensure high quality

products from the suppliers and save time money and manpower [1].

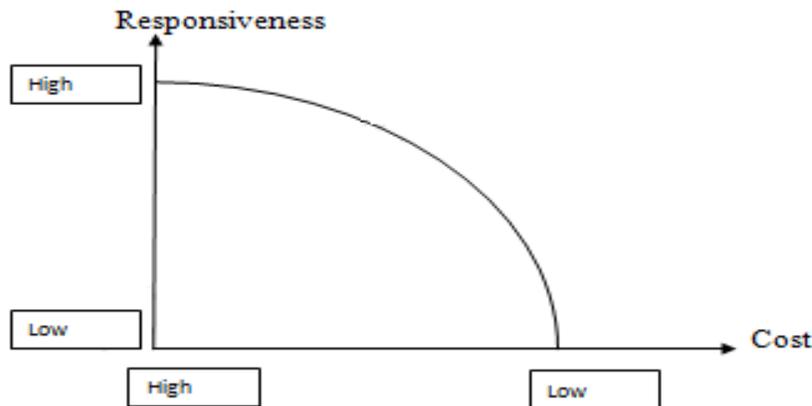
## II. WHY TO MAKE SUPPLY CHAIN “EFFICIENT OR RESPONSIVE”

The reaction of customers when faced with a stock-out is highlighted below in the pie chart. As the chart illustrates, over a quarter of shoppers i.e. 26% bought a different brand and 31% said they would shop elsewhere for that product. This represents bad news for both the manufacturer and the retailer. Even worse, other has suggested that over two-thirds of shopping decisions are made at the point of purchase, i.e. the purchase is triggered by seeing the product on the shelf. If the product is not on the shelf then the purchase will not be triggered. Persistent stock-outs can also drive customers away from the brand and/or the store permanently. The potential loss of business for both manufacturers and retailers caused by out-of-stock situations is clearly significant.



The above situation happened just because of the mismanagement in the SCM.

### EFFICIENT Vs RESPONSIVE SUPPLY CHAIN



	<b>EFFICIENT</b>	<b>RESPONSIVE</b>
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PRIMARY GOAL	LOWEST COST	QUICK RESPONSE
PRODUCT DESIGN STRATEGY	MINIMUM PRODUCT COST	MODULARITY TO ALLOW POSTPONEMENT
PRICING STRATEGY	LOWER MARGINS	HIGHER MARGINS
MFG. STRATEGY	HIGH UTILIZATION	CAPACITY FLEXIBILITY
INVENTORY STRATEGY	MINIMIZE INVENTORY	BUFFER INVENTORY
LEAD TIME STRATEGY	REDUCE BUT NOT AT EXPENSE OF GREATER COST	AGGRESIVELY REDUCE EVEN IF COSTS ARE SIGNIFICANT
SUPPLIER SELECTION STRATEGY	COST AND LOW QUALITY	SPEED, FLEXIBILITY, QUALITY
TRANSPORTATION STRATEGY	GREATER RELIANCE ON LOW COST MODES	RELIANCE ON FAST MODES

III.

IV. GOAL

1. Increase profits at every node of the supply chain
2. To ensure high levels of product quality received at subsequent node of SC from its predecessor.
3. Improved performance throughout the supply chain

Benefits:

1. Supplier development/quality won't be tied with investigation of poor performers in the supply chain

2. Reduced cost
  3. Confidence in supplier meeting the requisite requirements.
  4. Increased level of product quality received from previous node of the SC.
  5. Improved performance throughout the supply chain
  6. Increased in individual profit of the various individuals involved due increase in product quality due to less operational Costs.
- There are various elements in supplier chain management these are supply elements operation trends and logistics trends.

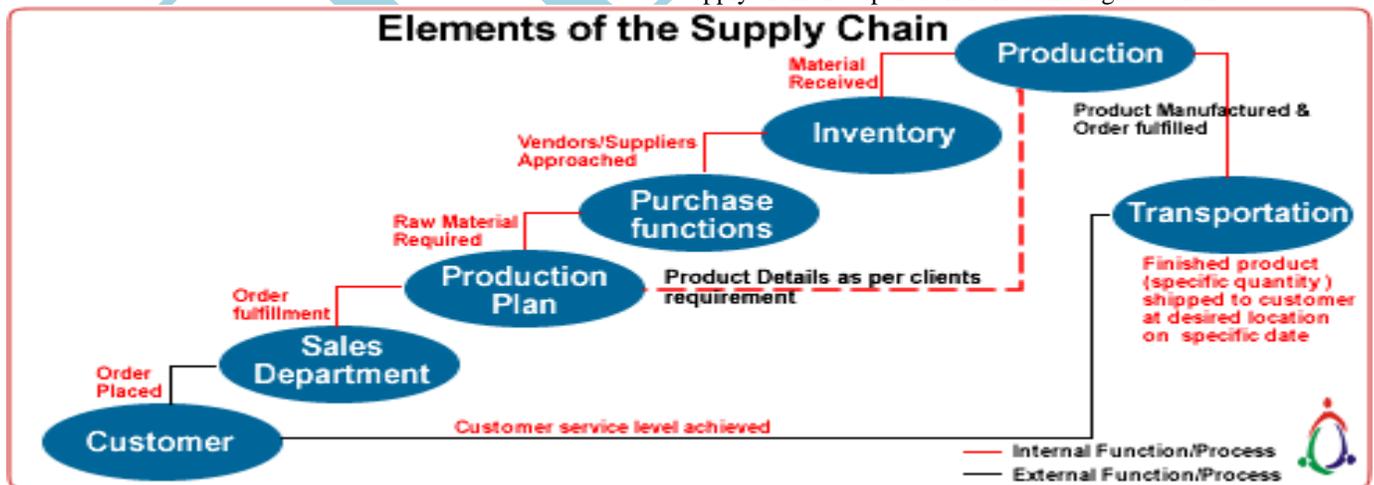


Fig 7: Elements of the Supply Chain[64]

Supply elements are managed by: supplier evaluation [60] wherein the supplier is evaluated on the basis of their performance trends and are even check for proper certifications that's is the products quality assurance and possession of the various standardized certifications like ISO certifications that

signify the suppliers authenticity and quality of product supplied [34-37]. Supplier elements also include ethics and sustainability where the product that is manufactured has a lesser carbon footprint and is sustainable for the future.

V. OPERATION TRENDS

These are elements of supply chain management. Under this Demand management implies matching the demand to the available capacity. It also includes linking buyers & suppliers via MRP and ERP systems. Use lean systems to improve the flow of materials to reduce wastage at levels in the supply chain. They use six sigma to improve quality compliance amongst various suppliers in the network.

## VI. LOGISTICS TRENDS

- These also include Transportation management.
- These includes the tradeoff decisions between cost & timing of delivering goods and customer service using either airways, water or railways or even all in some cases.
- Logistics trends have an essence that is the customer relationship management.
- Strategies to ensure deliveries, resolve complaints, improve communications, & determine service requirements
- Network design counts a lot in this.
- Creating distribution networks based on tradeoff decisions between cost & sophistication of distribution system [46-47]

## VII. INTEGRATION TRENDS

- Supply chain process integration forms an essential.
- When supply chain participants' work for common goals rather than their self-goals only requires intra-firm functional integration
- Based on the efforts to change attitudes & adversarial relationships
- Supply chain performance management is also required.
- Crucial for firms to know if procedures are working or not.

## VIII. TRADITIONAL AND MODERN SUPPLY CHAIN MANAGEMENT:

The early traditional SCM was based on push based strategy where the goods once produced were pushed into the market and no feedback was collected regarding the requirements or specifications because of which there was continuous supply and demand and the goods were being produced without the knowledge of how much was to be produced and sometimes there was shortage in the goods produced that never met the real time requirements of the customer.

There are various characteristics of the traditional SC:

1. The improper planning that never worked in synchronization with all the various players in the SC.
2. The performance of the individual was the main focus.
3. There wasn't a proper vision and the lack of long term growth plan and focus.

The shortcoming /challenges in SCM:

SCM needs to catch up to the bigger and more demanding roles which have been claimed by end users in recent times for which SC leaders are in need of equipping the team with requisite skills to match the ever growing expectations of contemporary times.

Some of the most predominant problems and suggested problem solving and suggested solutions to these problems:

### 1. Problem posed by configuration of distribution network:

Soln. This problem is being tackled by optimization of network flow.

### 2. Problem related to control of inventory:

Soln. This problem to certain extent is tackled by forecasting and inventory management [38,41-42].

### 3. Problem related to contracts of supply:

Soln. Most prevalent solution to this problem is Global optimization[40].

### 4. Problem emerging because of Distribution related strategies:

Soln. It is being checked by managing warehousing and transportation costs.

### 5. Problems emerging because of Strategic Partnering and Integration in SC:

Soln. Collaborative planning, Forecasting[39], replenishment helps in strategic partnering and integration in SC[43].

### 6. Issues related to Outsourcing and Procurement strategies:

Soln. Risk Management, Trade off between outsourcing versus buying cost is one of the most sort after solution to this problem[44-45].

### 7. Technical Glitches because of improper implementation and use of IT and DSS(Decision Support Systems).

Sol. These technical glitches to certain extent is resolved by implementation of ERP(Enterprise Resource Planning) and DSS. By practicing MIS which uses both ERP and DSS in best possible manner to obtain the desired result.

### 8. Problems related to Customer value:

Soln. SPC(Statistical process control), TQM(Total Quality Management) and Maximization of Service level. This problem is tackled by these tools.

To make SC more effective and efficient in its functioning various problems need to be addressed and resolved in time [48].

### 9. Problems posed by Globalization:

One of the toughest challenges posed by Globalization is of minimization of SC cost in accordance to end users price expectations.

Soln. Setting up of manufacturing firms in low cost countries significantly reduces direct and indirect cost and hence minimizes taxes [49]. Having Global Suppliers at the cost of on time delivery is still debatable. As it is not only about reduced prices, but also about on time delivery of goods and services [50-51].

Problems related to end user preferences:

Ever changing features of the desired goods and services act as add-ons to the already existing problem posed because of growing complexity in the global SC. Organizations are under constant pressure as they have to innovate in order to survive in Global Market.

Companies have to constantly re-design and re-engineer Supply chain in accordance to demand in a manner which is transparent for end users.

### 10. Problems related to market growth:

Hunt for new end users is always an unending quest. Organizations always try to expand their footprint to generate more revenue and in turn increase market share by expanding in emerging market.

Venturing into top market is a tough nut to crack owing to different factors like taxation policies, trading policies and various other government policies.

To tackle quench their thirst for bigger market share organizations need to rely on robust supply chain to optimize cost incurred at various entities of the chain to remain competitive and alive.

## IX. CASE STUDIES

**1. Toyota:**

The SCM in Toyota is very efficiently managed with a lot of employees working to produce vehicles in large scale using various methods of continuous improvement like; Kaizen. They use other methods like JIT and Jidoka. They focus to produce vehicles with least wastage. Toyota is one of the best car manufacturers in the World they are a 6sigma company. They constantly work on improving the supply chain by using various tools to reduce Bull Whip effect. Toyota has a very close relationship with its suppliers so that they are able to manufacture products that no or least defects creep in the Supply chain [52-54].

They constantly maintain a v4L network to maintain a balance in the supply chain. Each component of v4L [55] are: Variety visibility velocity variability

**Variety** is the demand in a region during a particular interval of time. This demand includes a mix of demands of a various group of persons. This helps the company realize what is the requirements of the customers in a particular region. The company therefore designs and manufactures vehicles understanding what is the requirement of the people in a particular country which is pretty obvious for a manufacturing industry which seeks to sell its product in the market.

**Velocity** of sales is another element if the v4L network. This involves understanding the demand and applying atleast 80% of the common demands offerings.

**Variability** of sales is reduced in the supply chain this is done

by conforming to stringent measures.

Visibility of sales is a process done to increase the sales in the regional level by modifying the Operations in the Supply chain. This is the v4L network.

**2. Maruti Suzuki:**

The SCM in the government created Maruti Udyog to Maruti Suzuki JV is very efficient. The supply chain:

They work with more than 400 vendors which also include global, Indian and JV suppliers. In a country like India there are a lot of hindrances that are created in the supply chain such as highway and transportation challenges or port challenges. Maruti aims in helping to achieve manufacturing their vehicles the the lowest costs thereby they work hard to reduce the operational costs in the Supply Chain. Maruti group sits with its suppliers and gives them training in the “pull” and Just in Time (JIT) manufacturing.

This is very different from what other manufacturing do. They maintain a constant relationship with their suppliers to help them understand these concepts for over six months. They identify their weaknesses and help these companies rectify it so that this particular supplier attains the best skills so as to supply good materials to Maruti.

**3. Mother dairy:**

The Initial part of the SC in Mother dairy starts with procurement of the milk from its farmer cooperatives which is supplied to the plant at around 2degrees Celsius. Each of the Local area vendors (LAD) places his demand a day prior to the sale. The tankers have HAM radios also to coordinate their supply daily. The company in Delhi has taken up the concept of Total Productive Maintenance (TPM) [56].

**4. Flipkart:**

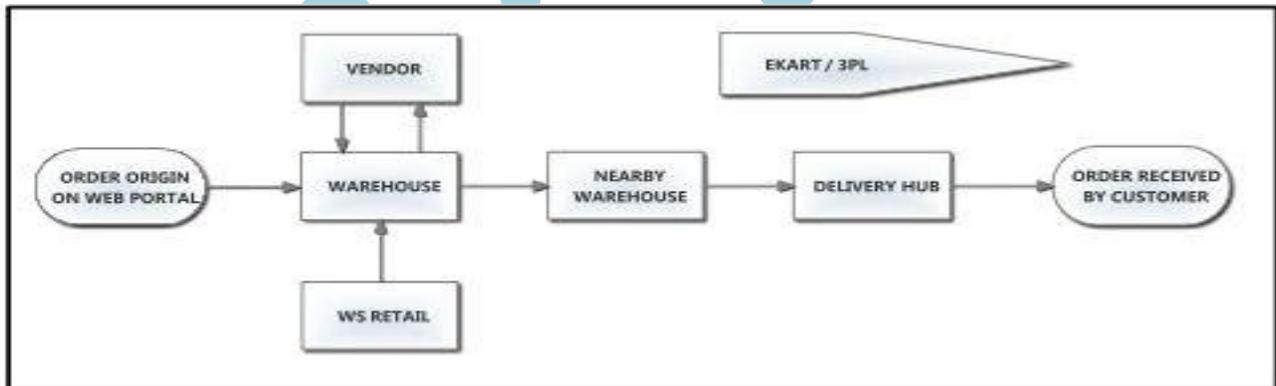


Fig 8: Supply Chain in Flipkart [64]

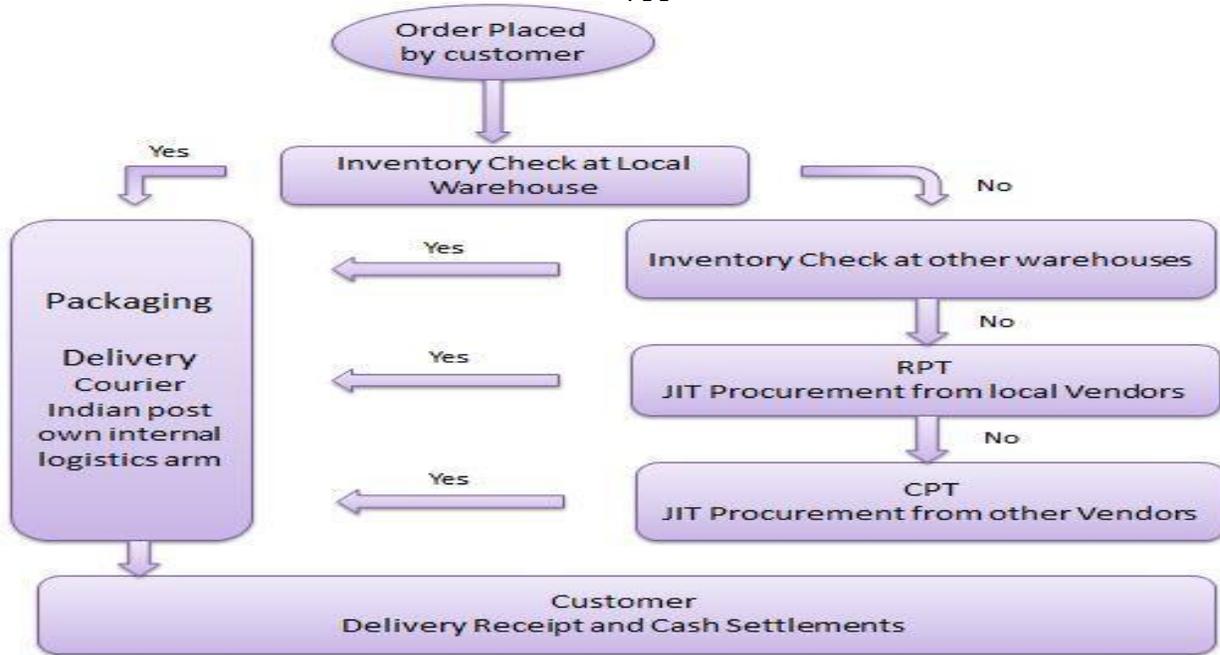


Fig 9: Supply Chain in Flipkart[64]

Flipkart has a very complex yet simple supply chain. This starts from the order placed by the customer. The inventory is checked by the local warehouse and the other warehouses as well [59]. JIT Procurement is done from the local vendors or else JIT Procurement is done from other Vendors under the company's

collaboration. The packaging is done within the specified time and the product is easily delivered under the expected dates mentioned to the customer. Therefore the company does a detailed forecasting on the products for the best timely delivery of the product to the customer [58].

X. KRALJIC'S MATRIX



Fig 10: Kraljic's matrix[64]

Kraljic's proposed portfolio purchasing model based on assessment of grids and maximization of profit. Its objective was to help purchasers to achieve reverse objective, (Maximization of Supply Security and minimization of cost) by making the most of their purchasing power. Procurement becomes more strategic than being a transactional activity [57]. As Peter Kraljic's once quoted, "Purchasing must become supply management". This laid foundation for various corporate strategies which has purchasers to calibrate risk and maximise profit by having the correct approach to procurement. The

Kraljics' purchasing model helps in classifying the product in some of supply risk and profit contribution and also inform purchasers whether the balance of power lies with them or the supplier. Once it is established one can select most appropriate purchasing strategy. This model includes following four steps:

1. Classification of Purchase
2. Analysis of Market
3. Strategic positioning
4. Action planning

**Classification of Purchase:**

This process commence by classifying all goods and services in terms of suppliers risks and potential profit impact.

a) Supplier risk shoots up when there is scarcity of raw materials. Maybe due to its availability could be easily affected by government instability or natural disasters, hence delivery logistics are difficult and could easily be disrupted, or when there is handful of suppliers. Potential profit impact of goods or services is high when it adds significant value to the firm's output. The possible reasons for this could be either that it makes up a high proportion of the output(for e.g. water for any packaged drinking water company) or it has greater say on quality(for example cloth used by high end clothing manufacturer).

2. Analysis of Market mostly depends upon investigation of the quantum of power possessed by suppliers and their customers.

One of the most appropriate ways of doing this is by employing quarter's by courses analysis. Five force analysis relies on five critical forces that determines and guide the competitive power in the business situation. These are

1. Suppliers power
2. Buyers power
3. Competitive rivalry
4. Threat of Substitution
5. Threat for New Entry

**Strategic positioning:**

Classification of the goods and services identified as "strategic" in first and second steps. This is done by entering particular item in purchasing portfolio matrix as shown below:



Fig 11: Kraljic's matrix[64]

4. Last but not the least it all boils down to development a robust action plan for individual product and material required on a regular basis pertaining to those items which are placed in purchasing portfolio matrix for making of goods and services required for consumption.

The most prevailing purchasing strategy employed are as follows:

- a) Exploit
- b) Balance
- c) Diversify

a) As the name suggests it tries to make the most of high purchasing power to secure competitive prices and long term contract from a number of suppliers so as to minimize the supply risk involved in these critical items for purchasing of "individual batches of the items" is made is a good deal is made by a particular supplier. The only caviar is not to take any aggressive and impromptu decisions just in case the circumstances changes.

b) This approach highlights the balance between the exploitation and the diversification approach.

c) It promotes the minimization of the supply rate by venturing alternative supplier or alternative product. For example for logistics transportation one can rely on railways, roadways and waterways instead of relying solely on road transportation.

Purchasing power can be increased either by consolidating to a single supplier or in other circumstances by bringing the production of the item in-house.

**XI. CONCLUSION**

This research focuses on the complexity of the supply chain and the different hurdles faced by the various entities in the supply chain. These days' supply chain faces a common hurdle commonly called the bullwhip effect which is minimized by applying various methods that help to reduce this defect. The researchers here have conducted a brief study focusing on the suppliers. We visited a few companies and exhaustively analyzed their complex supply chain. This research is a product of a lot of time of extensive study on the various entities of the supply chain and the relationship among them. The relationship amongst the entities is very important in the modern supply chain. Even from a supplier's point of view the relationship he/she maintains with the distributors etc plays a very vital role for it so that it survives in the market.

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