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Impact of Supply Chain Management on Business Performance Related to Polymer Processing Industry in India

Rajneesh Pal Yadav[1]
Research Scholar,
Dr. Abdul Kalam Technical University,
Lucknow, India.

Dr. Kushendra Mishra[2]
Research Guide & Associate Professor,
BBAU,
Lucknow, India.

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Abstract: ***Indian Polymer Processing Industry is one of the oldest trade in the country dated back to several centuries. Pan India industry with a big scale of export and domestic market at its disposal, the industry has got a complete makeover and evolved itself over passage of time. Indian Polymer processing is fairly spread over now at Ahmedabad- Gujarat, Gaya-Bihar, New Delhi, Mumbai, and Calcutta apart from Bangalore and Mysore. Indian Polymer processing industry is controlled by Bangalore, Karnataka for several centuries and Uttar Pradesh Lucknow ,Kanpur,Varanasi,Allahabad,Rae Bareli, Barabanki, Ayodhya, Agra, Noida districts were the manufacturing base for Bangalore based companies for a long time and still a dominant role is played by this geographical area. The study area is Uttar Pradesh.***

1. INTRODUCTION

A supply chain constitutes stake holders in a trade who are part of the business, and contribute directly or indirectly in fulfilling a demand of the market forces or consumers. The supply chain encircles manufacturers and their partner's viz. suppliers, source, process, equipment, raw material inventory, warehouses, financial vehicles, logistics, trade partners and the customers themselves who complete the cycle. In each business and manufacturing cycle, the supply chain includes fulfilling a demand with quality prices and timely supplies and includes product development, sales, operations, finance, logistics, distribution and customer service.

1.1 THE CONCEPT OF SCM (SUPPLY CHAIN MANAGEMENT)

It all started in mid 1980's **Christopher, martin L (1992),** in his book "SCM (supply chain management) and Logistics ". While logistics simply confabulated with physical process of inflow and outflow of goods, SCM (supply chain management) coordinated for smooth flow of materials, process, finance, logistics and the entire gamut of the industrial activity.

SCM is an expanded version of logistic process and the area of business transacted by the companies reached to intercontinental and wide area. It was no longer an organization alone taking decisions but needed business associates, sourcing partners and mechanisms for a wide range of activity.

The final phase of integrated SCM that is in vogue now started in mid 90's. The basic idea is to coordinate materials, equipment, people, finance, logistics and system as one single entity. A design system to integrate and manage a quality product while emphasizing on cost, quality, delivery, flexibility and service factors. The system evolved to aim for long term cost reduction and at the same time to ensure better quality product and service to the customer.

The purpose was to increase profitability and operational efficiency to the organization and to convert the maximum required product for the buyer.

1.1.1 SUPPLY CHAIN & MANAGEMENT

The supply chain (SC) refers to the attached group of resources & procedures that starts with the product to the consumer.

1.1.2: MEANING AND ORIGIN OF SUPPLY CHAIN

The SC is a unique, influencing theory that consists to the seamless flow of information, products and its funds between the different phases among participating suppliers and medium of flow of materials to finish the cycle in the delivery of the product. SC, thus, implies all the players, companies and medium of business transaction. Lambert Doughlas M., Ellram (1998), in his book '"Fundamentals of Logistics Management", writes". A manufacturer receives material from different suppliers at different phases of manufacturing and supplies to a range of distributors at several places for the same product or a range of products".

1.1.3: SCM (SUPPLY CHAIN MANAGEMENT) (SCM) EVOLUTION

SCM has originated from the traditional materials management portfolio andthe evolution is termed now as the SCM(SCM (supply chain management)). Since, the early years of the material management originated in the industrial revolution in 1850. However, the purchase of material had received attention as a separate portfolio even before this period. This function developed after industrial revolution with the subsequent introduction and development of the railway's materials management which was responsible for services of transportation, the inventory management, and purchase of materials, its storage and handling of the materials during production process.

1.1.4 Effective Distribution

The effective distribution involves the addressing the shortage of inventory both including the raw material and the finished goods. The difference between the material management and physical distribution implies that under the physical distribution, the emphasis was on the outbound transportation, storage, packaging and warehousing sothat finished products can be delivered on time without getting any physical damage. Material management was more of inbound services like material inflow within the organization which includes services like transportation, inventory, material purchase and handling of materials during process.

1.2 LOGISTIC MANAGEMENT

During and after the First World War, there was a genuine demand to evolve logistics as a key function. Due to the war, it was expensive for firms to maintain inventories to serve the customers and the companies to maintain the smooth flow of resources with the effective physical distribution system. Thus, this forced them to initiate the cost saving practices to deliver the goods on time. This gave rise to logistic management.

As the organizations started expanding their wide area of operation, the logistics management paved way for the broader scope of management and involved strategic decision making. As the operations expanded widely covering a broad market area, it resulted in varied requirements of inbound material from various sources, suppliers and their transportation, the handling process, work in progress i.e. inventory, finished goods (FG) as well as outgoing logistics with exchange of info. All this led to integrated logistics management.

1.3: CHALLENGES IN SCM

In implementation of SCM organizations have kept the focus on delivering cost valued product to the customer. The value chain thus created from various sources to the point of process and the outbound movement of product to the customer is a custom planned strategy that is unique for each industry. The intense competition among the products is inconsistent and the **(Sunil Sharma).**

Another issue facing SCM (supply chain management) in countries, like India is lack of data availability to monitor all the activity related to sales, consumer behavior and preferences etc., and thus, needs to rely on the external information. The

complexity of supply chain networks which are usually multilayered both for inbound and outbound movement is another potential challenge to SCM.

Lack of professional ERP (Enterprise Resource Planning) tools to track intelligent supply chain process and value chain is still at nascent stage in countries like India. Lack of Indian centric logistic providers especially third party logistic providers for the transportation, tracking, and tracing of consignments and other services are yet to develop. There is hardly an integral service provider who could provide integrated sea, air, road transportation and distribution that gets highly disintegrated and localized, resulting in the supply chain deficiencies. There is stiff resistance of outsourcing of services by employees of the company. Factoring the cost of SCM is another issue faced by companies.

The challenge of managing the supply chain process from procurement, logistics, handling and outbound packing, warehousing etc., has to be environment friendly which is a critical problem that needs to be solved. Measuring demand uncertainty, measuring product availability, framing right replenishment process, are some of the main obstacles and problems interfaced by the SCM (supply chain management).

1.4 ELEMENTS OF SUPPLY CHAIN

The elements of supply chain kept on changing as per the needs and changes in business environment and scope of operation of the company. The requirements of the company varied from range of products, scope of business and process. The basic contours of supply chain can be broadly classified as follows:

The primary focus is conceptual understanding of the need of the organization to assist the management to design the specific Supply chain requirement of the particular industry. This will vary from one industry to another.

a) **Process**: The facility used at the point of manufacture. i.e. machines, men,technology, place and the process involved in the making of the product. This is one of the most important elements in the production line of any organization. This differs from each product line from the basic pin to helicopter; there is a distinct difference and technology in the process involved.

b) **Demand forecast**: Effective supply chain drivers start with demand forecast. The efficiency of the organization is to estimate the change and the fluctuations of customer requirements. The entire organization's plan depends upon the accuracy of this estimate. Fischer(1997) pointed out that the correlation between the implied demand uncertainty results in an immature product life cycle. (PLC)

c) **Inventory management**: This is a key supply chain driving element to manage the successful process with smooth inflow of raw items and to ensure outflow of the final goods to business, trade channels and to the consumer.

d) **Sourcing:** Sourcing decisions effect the responsiveness and efficiency of supply chain. Global brands choose to select facilities of their choice for global level marketing; they also select the country for processing based on strategic decisions, which are related to sourcing of components, spares and manpower availability. A global brand like Apple Inc., choose to outsource its entire assembling facility at China, for selling them in Europe. This was a strategic decision taken by the company by considering range of issues and to place the product into the market. They choose the place after they ensured the necessary technology and input materials were strategicallysourced to ensure smooth flow of production and the final product to the market.

e) **Logistics:** Integrated logistics management is a very important element in SCM. As the souring and selling canvas of organizations expand spanning several countries, the logistics management becomes a key element in SCMThe innumerable numbers of inbound raw materials have to be sourced and shipped from respective sources that in modern day economics are across diverse locations, countries and multiple vantage points. Not only the organization should ensure that all the requirements of the manufacturing industry should reach a particular facility for smooth production but also ensure all of them are shipped and kept at warehouses to ensure just in time as part of modern day SCM. The inventory planners ensure cost is

not lost on idle inventory. Logistic management became an art of managing sourcing of inbound raw material, warehousing, inventory, and out bound transportation to several market and channel partners.

Thus logistics became cost centre by itself in saving cost thereby enhance the profit of the organization and is key element of SCM.

f) **Finance:** Organization has a scale of operation and the scale is directly linked to the capital employed. Working capital arrangement is fixed based on the cycle of business and turnaround time of the capital, facilities with bank for raw material purchase and value of the inventory. This is key aspects in SCM(SCM (supply chain management)). The cost saved by managing the SCM is the key to the pricing policy amidst competition which determines the successful operations of the company.

The cost incurred on the inbound material along with logistic cost, the cost saved during the process and the ability to produce at an optimum cost is the key to supply chain. The company saves cost on the inbound and upstream movement of material.

Pricing policy is another key factor of SCM. The cost of services or the product should have a better realization for the organization. A successful SCM ensures better value for the customer and better realization value for the organization.

It is very important that these elements do not act as independent entities but interact with each other to give an integrated output to the organization. They are independent elements but interdependent in terms of cohesive function.

1.5.1 FACTORS INFLUENCING SUPPLY CHAIN

Organizations always begin with competitive strategy and back work to face competition and to be profitable and successful venture as business drivers. The SCM (supply chain management) is one of the major aspects towards achieving this goal. Supply chain operates on uncertain and unpredictable environments. The result of SCM (SCM (supply chain management)) is to predict the uncertainty and give accurate management of inconsistencies.

The factors that determine managing the uncertain climate of supply chain are:

(a) Gap between supply and demand: Understanding the demand is the first step to be taken by an organization to start its business operations. To understand the customer, the company must identify the needs of the customer segment that needs to be served. Supply chain has to make a distinction between the demand uncertainty and the implied demand uncertainty. Thus, understanding this uncertainty is one of the very important factors.

(b) About to understand the SC (supply chain) capabilities: After taking uncertainty into factor, the company takes the next best way of addressing the uncertainty by understanding its own strategy and capabilities to respond to the uncertainty. Like customer needs, supply chains have distinct characteristics to respond to this situation. The ability of the organization to address the variations in inventory, order backlog, and addressing dynamic priorities are key factors in the understanding of the SC capabilities.

(c) Achieve the perfect implementation of SCM for consistently balance the above: **Lee H L** The organization should attain strategic fit which is a most important factor in supply chain.

1.5.2 EFFECTIVENESS / CONSEQUENCES OF SUPPLY CHAIN

Supply chain has emerged as an effective tool in recent times in driving the organization towards positive growth trajectory. Supply chains aided by :

1.6 NEED AND IMPORTANCE OF STUDY

Supply chain is a modern concept to cater to the modern day evolving and always changing environment and market. The need for scientific system to organize men, materials, locate, transfer into the process and ensure the value chainis bonded into the system and to monitor and assess the ever changing market dynamics into a single entity. The constant in the entire chain is the system where sources of material change on need, the process has to be adaptive and the seasonal changing scenario of the market demands have to be catered to. The organization must serve all the above purpose but at the same time it must also be flexible enough to change, adapt and mould itself to suit the circumstances and to face the competition and emerge successful and at the same time should get better yields and returns for the organization and satisfaction to the buyer.

The requirement is complicated and hence there is a need and importance to take an in depth view into supply chain, and the operational effectiveness and performance this value chain has contributed to the Indian Polymer Processing industry. SCM (supply chain management) has evolved in the modern times and this has created big quantum change in traditional industries which have existed for several years and have been operating at old trial and error method.

2 REVIEW OF LITERATURE

Sastry, T. (1999) requirements restricting to take advantages of market opportunities. Citing examples from leather shoe & textile dyes from Brazil, Taiwan, China & Indian industry, he come toconclusionthat these industries are not in a positiontomanageaffecting markets with high uncertain demand. He suggested that by designing defensive, coordinated and with competitors, provide secure profitable niches to small firms by overcoming problem of working capital, market demand and low profit margins.

Vickery and Droge (1999) focused on product, volume, launch, access & target market supply chain flexibilities and examined their relationshipData were collected through mailed questionnaire from 65 USA firms of residential furniture industry with sales revenue exceeding $1 million annually and representing a response rate of about 20%. The results suggested that volume flexibility (r= 0.28, p= 0.026) and launch flexibility (r=20, p=0.09) are key responses to flexibilities with performance is highly correlated.

Harland et al. (2001) examined the nature of interconnected entities involved in in variety of U.K industry sector first stage of the research was contained eight in final stage 50 manufacturers were contacted through a structured telephone survey. Firms having proper network with others have higher power relationships and can control & manage their networks. A manager should consider the nature of networking activities such as while applying to networkingactivities.

Halley and Nollet (2002) examined the extent of supply chain integration in multibillion and multinational organizations. The data were collected from 164 suppliers sub-divided into 110 regular suppliers, 32 strategic partners (preferred suppliers),. The response rate was found to be 53.8 percent. The study highlighted 2 main elements. First, a suppliers contribution to the integration of a large order - giver's study come toconclusionthat the preferred status should be given to large order giver and the organizations should provide decentralization and preferred managerial & financial support.

Parson, A.L. (2002) investigated the determinants developers and maintainers contacted . Results of the regression analysis showed that of all communication with relatively high beta weights emerged a powerful variable, followed by customer orientation, disclosure, handled risk and expertise and among interpersonal variables influencing relationship quality. The study suggested that from manager's perspective, sales people and representatives who are knowledgeable of products, customers and industries had higher quality relationships.

Zsidisin, G.A. (2002) focused on production outsourcing and nature of inbound supply risk resulting .Seven in-depth case studies on US industries namely, aerospace supplier, computer manufacturer, electronics, cellular phones, semi-conductors were conducted which were involved in such supply risk management. Data generated enticed three themes i.e. item, market and

supplier characteristics to open and Axial coding. Timely supply of electronic goods affects long term profitability and perceived risk with new products which involves considerable time and resources. The supply risk perceptions are effect by specific supplier characteristics namely, The research suggested that managers should first categories supply risk which helps them in determining supply strategies and should supply risk and the characteristics of other firms may be different according to the industry.

Sloan and Landers (2002) described the use of Intelligent Tracking Technologies (ITT) which includes wireless telecommunication and Radio Frequency Identification (RFID) in improving manufacturing & integrating the entire supply chain. They suggested that introduction of RFID, Bar-code or data matrix into real world situation should aim .

Sahay and Gupta (2002) focused organizational thinking process as a precursor to improve SCMThey found that organizations. The solution to the problem lies in uniting people through a shared vision across the organizations, imbibing organizations culture, transforming the mindsets of employees from resistance to the new pattern by leadersorganizations for achieving competitive advantages.

Deshmukh, U.M. (2002) evaluated the effectiveness of inventory control function in 19 public engineering industries in Kolhapur districts of Western Maharashtra. The results of study indicated that size of inventories. Work-in-progress inventory depends upon utilization, the managements policy about building up in-process buffer-stocks. The size of finished products inventory also varies and dependent on the study found all the engineering industries efficient and productive. The study suggested adoption of for effective management of inventories and should develop norms for different components of inventories.

3 OBJECTIVES OF STUDY

1. To Finding Out key variables of the existing Distribution Network that Effect the Business Performance
2. To find out the Key Factors affecting sourcing decisions of the Polymer Processing Industry
3. To find out the Demand Management – Inventory Management (seems little incomplete add organization name of what inventory management is about to find.)

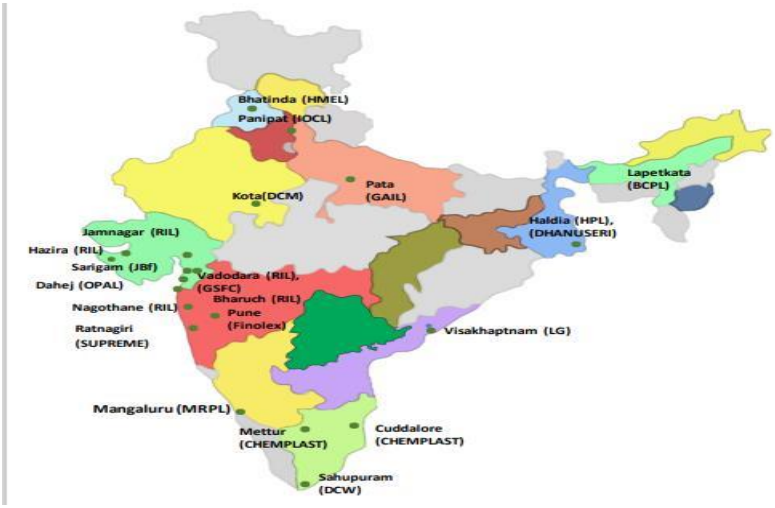
3.1 LIMITATIONS OF THE STUDY

Time constraint & cost, the survey is restricted to only one state, thus, it is limited to the districts of Uttar Pradesh only. The study covers only all the popular districts for raw Polymer Processing stick production located in Uttar Pradesh.

1. The study had been conducted based on the responses of the respondents working as executives in incense companies. Individual responses may differ from each other and from one geographical area to other.
2. Implementation of SCM in Polymer Processing industry is a new theory in processand the research might not deal with it in a comprehensive manner

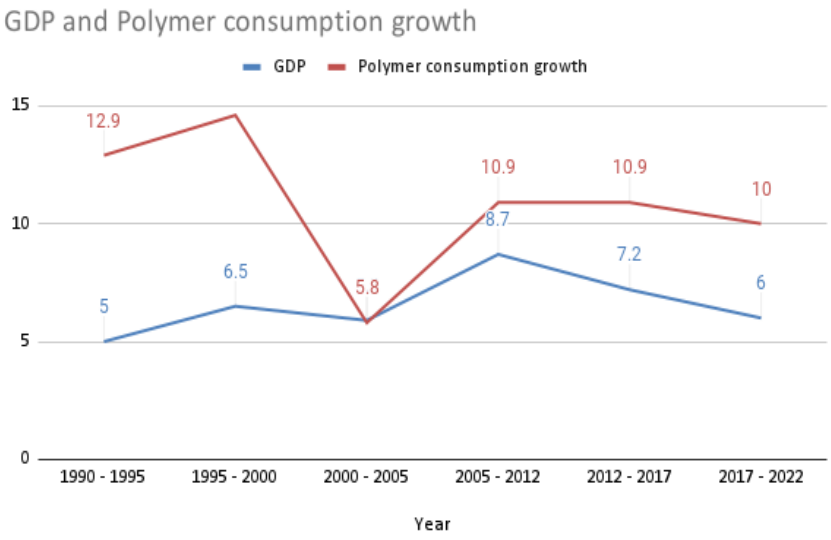
4.1: THE PLASTICS INDUSTRY IN INDIA: AN OVERVIEW

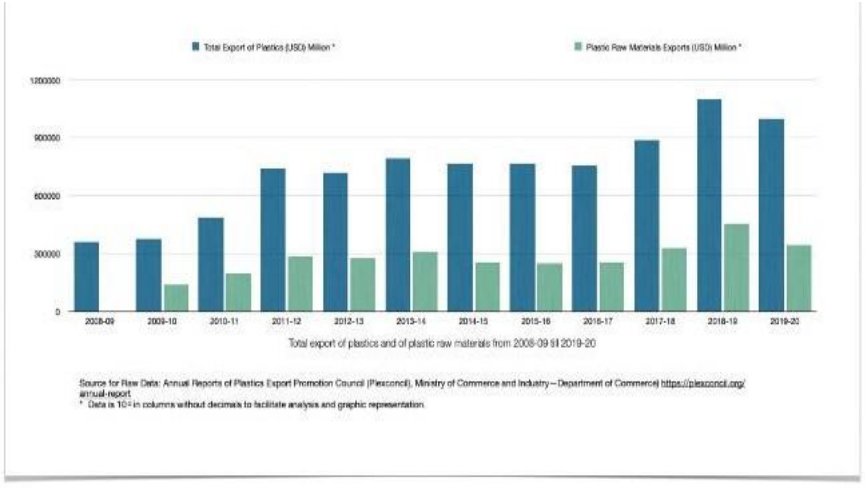
4.1.1 MANUFACURING PLASTICS IN INDIA: FUTURE TRENDS IN THE INDUSTRY



Source: Report on The Indian Plastics Industry, 2018 (https://plastindia.org/pdf/Indian-Plastics-Industry-Report-2018-2.pdf)

4.2 THE SIZE OF AN INDUSTRY





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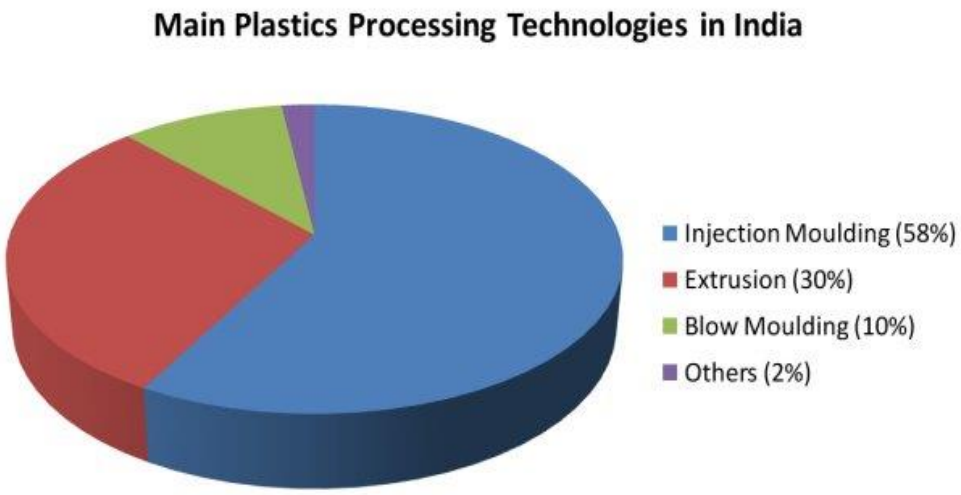
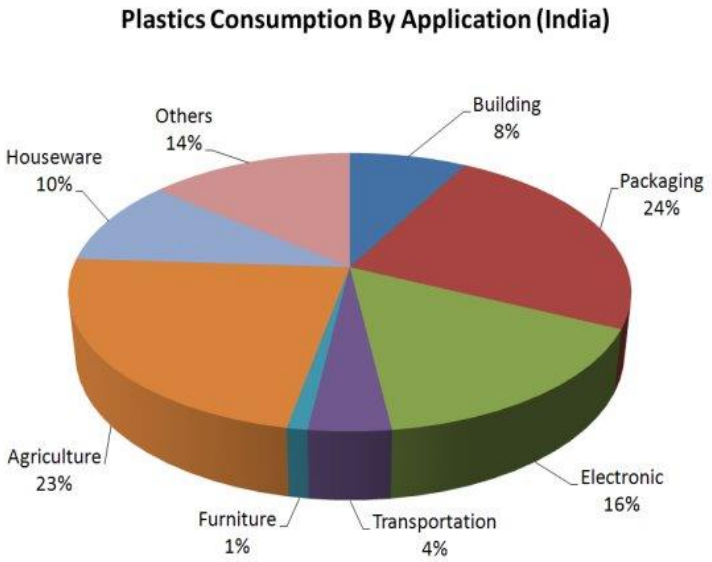




4.3 RESEARCH GAP

This research work is distinct in dealing with these processes viz.

A. Transformation of industries aided by SCM.

B. Operational performance of industry related to A.

C. Enhanced delivery of products to customers.

Kearney et.al.,(2006) in their research publication "Meta-analysis of randomised trials" discusses a framework to identify a SC(supply chain) & how to approach forthe development of strategies in the supply chain with the purpose to transform the industry and to enhance the operational performance.

This research work focuses the study of the operational performance of the industry, synchronized with the transformation of the industry aided by the tools ofSCM. The thrust area of this research work thereby deals with how SCM aids transformation of trade- profitability, enhanced product, delivery , cost, quality and flexibility. Hence the focus will be on the industry/ production process which plays a major role in SCM and not on complete cycle of delivery to the customer.

Dr. Dawei Lu (2011) discuss the element of SCM that come together which comprises of groups of services and companies that come together to add value to their product and delivers them to the customer.

This research work establishes the array of supplies, suppliers coordinated into a single marked effect to assemble a host of sources into the process unit and to deliver the product. How successful the units can achieve this creates an effect on the operational performance of the organization.

This research work analyses the various sources of diverse product portfolios and the management drives behind achieving this target in a Polymer Processing unit and industry. The raw material required are diverse and sourced from differentcountries. The individual drivers of SCM ensure the focus on organizing the products from sources and involve meticulous planning which are components of SCM.

This research undertakes to confirm how SCM practices in the Polymer Processing industry are effect d by the caution of protecting against disruptions, managing timely delivery, production innovation .The exponents of SCM and its successful implementation results the operational performance of the industry. Failure to implement and supervise the strategy effectively reduces the Operational performance.

The pertinent areas of study is that when most of the SCM research has focused on large and medium sectors and is of global outlook, this research has chosen SMSE and has attempted to classify the various scale of operation within SMSE preamble.

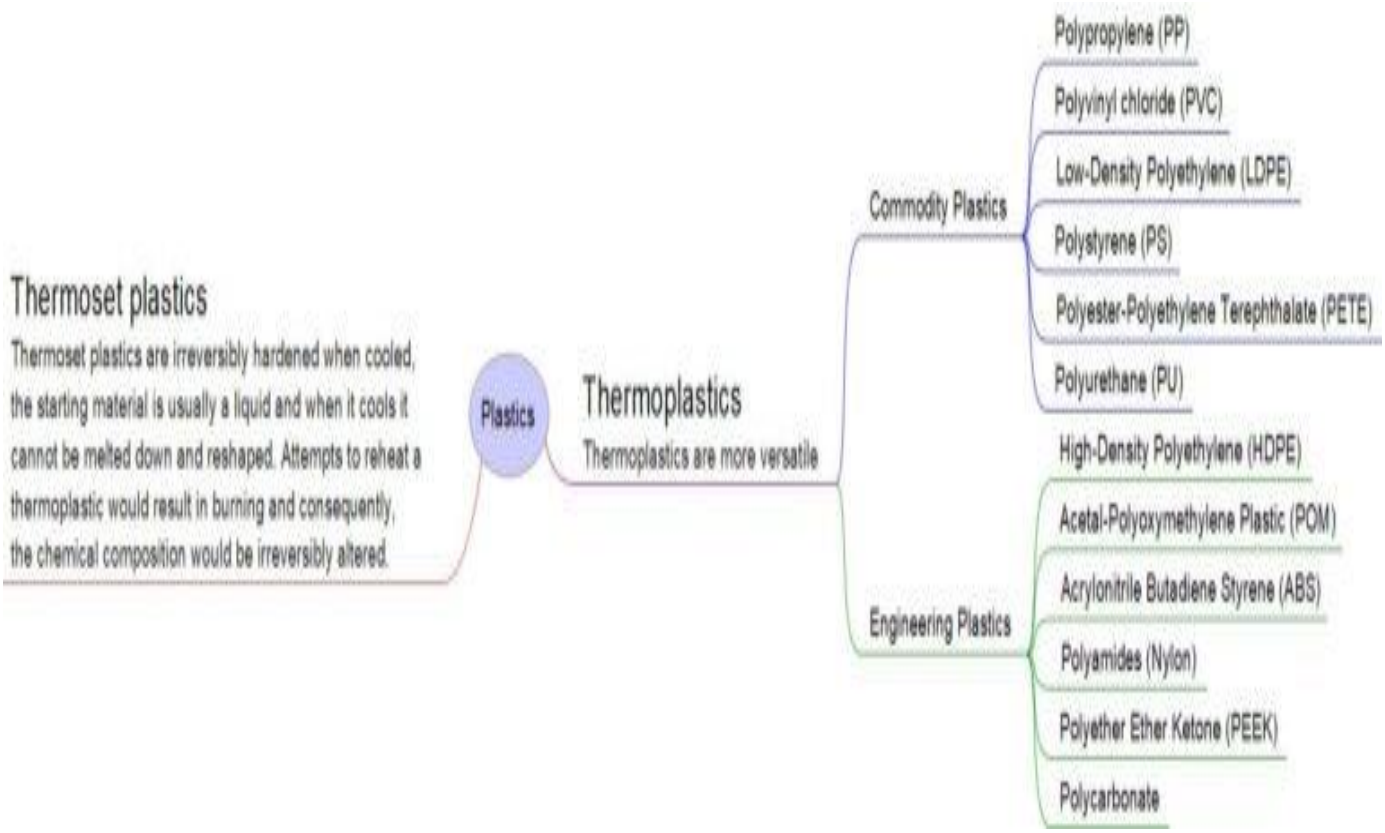
Among SMSE, the chosen industry is Indian Polymer Processing industry which is mostly India centric industry in India, the fore runner of manufacturing hub Uttar Pradesh is the sample area, on which various analysis have been applied,experimented and research process arrived at not attempted earlier.

The attempt has been made to emphasize how standard approach to SCM (supply chain management) has been inducted into indigenous trade that has been in vogue for several centuries and the transformation of the trade that has resulted in effective operational management and advantage for the industry.

In the manufacturing unit and how SCM has absorbed into the system for superior operational results. Necessary care has been taken to develop the sample surveys to map the areas of research and document, analyze and arrive at a scientific record of facts and analyse the effect of the process.

The researcher has attempted to make an intrinsic research on the effect andeffectiveness of SCM on the size and scale of the industry, economic criterion to analyze if the size of the unit has any the industry operational industry.

In this research the focus is on the manufacturer / company which is the customer to the immediate supplier. The analysis gains intensity and warrants a sustained study due to the fact that the downstream company / organization remains unchanged while the upstream to the company has undergone a sea change.



The Commodity Plastics

CONCLUSION

This chapter establishes the effect of SCM on the operational performance of Polymer Processing industry. Statistical tools like linear multiple regression analysis, cluster analysis and chi-square analysis are deployed to come to conclusion the estimation of perceptual dimensions of the executives on effectiveness of SCM on operational performance of the raw Polymer Processing industry. A model of effect of SCM on operational performance is also presented. The final chapters are the summary of findings of the study and suggest measures for effective operational performance and provide scope for further research and study.

This chapter completely evaluated the SCM (supply chain management) elements and the factors influencing the SCM (supply chain management) through percentage analysis, parametric t – test, one way analysis of variance like contribution of variables and relationship between independent organizational variables and supply chain perception of executives. The next chapter analysis studies the effectiveness of SCM.

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