



A STUDY OF SUPPLY CHAIN MANAGEMENT IN REFERENCE TO
INDIAN OIL SKYTAKING

By

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Declaration

This is to certify that the Mr. Ravindranath R C, a student of MBA in Logistics and Supply Chain Management, SAP ID 500068926 of UPES has successfully completed this dissertation report on “**A Study of Supply Chain Management in reference to Indian Oil Skytanking Private Limited**” under my supervision.

Further, I certify that the work is based on the investigation made, data collected and analyzed by him and it has not been submitted in any other University or Institution for award of any degree. In my opinion, it is fully adequate, in scope and utility, as a dissertation towards partial fulfillment for the award of degree of MBA.



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CHAPTER 1

INTRODUCTION

1.1 Introduction to the Topic

Supply chain management (SCM) is that the broad vary of activities needed to arrange management and execute a product's flow, from feat raw materials and production through distribution to the ultimate client, within the most efficient and cost efficient manner potential.

SCM encompasses the integrated designing and execution of processes needed to optimize the flow of materials, data and monetary capital within the areas that broadly speaking embrace demand coming up with, sourcing, production, inventory management and storage, transportation or provision and come back for excess or defective product. Each business strategy and specialized software system are utilized in these endeavors to form a competitive advantage.

Supply chain management is associate expansive, advanced endeavor that depends on every partner from suppliers to makers and on the far side to run well. Because of this, effective provide chain management conjointly needs modification management, collaboration and risk management to form alignment and communication between all the entities.

In addition, supply chain property that covers environmental, social and legal problems, additionally to property procurable and also the closely connected conception of company social responsibility that evaluates a company's result on the atmosphere and social well-being are areas of major concern for today's firms.

Benefits of supply chain management

Supply chain management creates efficiencies, raises profits, lowers prices, and boosts collaboration and a lot of innovations. SCM allows corporations to manage higher demand, carry the proper quantity of inventory, modify disruptions, keep costs to a minimum and meet client demand within the only manner attainable. These SCM advantages area unit achieved through the suitable ways and software package to assist manage the growing complexness of today's provide chains.

1.2 Company Profile

IndianOil Skytanking Private Limited (IOSL), is a Joint Venture company promoted by Indian Oil Corporation Limited (IOCL) and M/s Skytanking Holding GmbH, Germany (ST) with equal equity participation.

Incorporated on 21st August 2006 IOSL is the forerunner in implementing Open Access Model in Fuel Farm Operations and Single Man Refuelling in India. IndianOil Skytanking is in the business of handling Jet Fuel for Airlines on behalf of the suppliers. The decade long journey commenced its operations in May 2008 at Bangalore International Airport through a BOOT business model. It was then followed by providing O&M & ITP services at the IGI Airport - the World's best Airport in the category of 25-40 million passengers, the largest in the country in terms of air traffic movement, Jet Fuel requirement, Jet Fuel Storage facility and longest hydrant refueling system effective July 2010. Along the journey IOSL established its presence at Mumbai Airport providing into-plane fueling services effective January 2015. Having carved out a niche with lean, efficient and cost effective operations the Oil Marketing Companies began outsourcing the operations & maintenance of their Aviation Fueling status. Today the Company has established its operations at five civil airports and two defense bases apart from the three metro airports, taking tally total 10 locations. IOSL today, proudly operates and manages airports located at 3000 m above MSL and that too under hostile and adverse climatic conditions.

IOSL is an ISO 9001 & 14001 accredited organization. The credit rating of IOSPL by CRISIL is AA- stable and by CARE is AA in 2016 and has been consistently adding value to its share-holders.

Indian Oil Skytanking Private Limited (IOSL) is currently India's leading private company in the field of Operations and Maintenance of Fuel Farm and into plane services. IOSL subsequently established into the business of commissioning of Hydrant systems.

IOSL handles 44% of Jet Fuel consumed Pan-India, which currently translates to 3,273 TKL registering a CAGR of 33% over the past decade. IOSL refuels one aircraft every second minute across our network delivering an average of 312KL per hour. The current market shares of Into-plane fuelling business stands at 73% on a combined basis of Bangalore, Delhi and

Mumbai Airports and these three airports account for approximately 37% of All India consumption of Jet Fuel.

This Operational excellence is backed by comprehensive support functions like HSSE, HR, BD and Finance. A steady growth, expansion and profit demonstrates a holistic, progressive and professional approach to conducting business that is also in sync with dynamic business environment.

IOSL has also been engaged in the business of Technical Consultancy to Airport Engineering, Procurement and Construction (EPC) contractors, Airport Operators as well as in the Commissioning of Fuel Hydrant Lines at Airports.

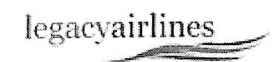
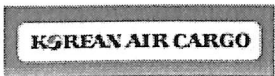
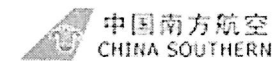
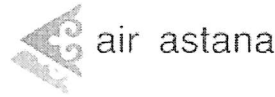
IOSL believes that “Success does not come from doing easy work but comes after the achievement of a challenging and difficult task that demands best efforts and right attitude”.

Vision and Values

- IndianOil Skytanking is the Best & Most Preferred Aviation Fuel Farm Operator and Into-Plane Agent in this Part of the World.
- IndianOil Skytanking is a Great Place to Work.

Into Plane Airlines





Suppliers



1.3 Objectives of the Study

- To perceive the implementations of innovations in offer chain and supplying management at Indian Oil Sky tanking.
- To analyze the precise segregation of the business.
- To establish varied dimensions of SCM systems in hand-picked organizations within the petroleum sector.
- To analyze success and hindrance factors for SCM systems within the sector organizations.

1.4 Statement of the Problem

An organization formulates its production and operations plans to compete in the market. Several issues come in the way while developing strategies and plans related to operations management. The core purpose of these plans and strategies is to deal with the prevailing threats in the external environment of the organization and exploiting the beneficial opportunities. Organizations must address the issues of operations while formulating their strategies. The most significant problems for a company are the problems associated with method style, capacity management and quality management.

Today Consumers have higher expectations than ever before. They want products to match these expectations. They additionally wish correct, up-to-date and helpful data regarding what they purchase and especially they have Quality. So, in order to understand the nature of supply chain management of the organization, I took this supply chain Management as a topic

for my project, to give findings and suggestions by adopting and analyzing supply chain management of Indian Oil Sky tanking.

1.5 Need for the Research

Supply Chain Management (SCM) is essentially integrating suppliers to the end consumers and emphasis the need for collaboration to optimize the whole system. The basic aim of any SCM perform is to create the organization a lot of agile and nimble footed to reply to drastically dynamical shopper preferences by capturing the information of material flow in any respect levels of the worth chain.

An effective supply chain management system will give a 360-degree feedback to the merchant as well as to the manufacturer concerning the recognition and complaints of any specific product. Provide valuable insights on inventory and guidelines on merchandise allocation. It conjointly will increase visibility of stock sales and client demand throughout the provision chain facilitates collaboration and communication for rising relationship with suppliers.

1.6 Background of the Study

Competition in the new millennium will be across supply chains, not individual companies. The central aim of any business is to have the right products in the right quantities, at the right place, at the right time at minimal costs. This is successively translated into the interrelated problems with customer satisfaction, inventory management and adaptability . Customer satisfaction to a high degree is dependent on the flexibility of the supply chain, i.e., its ability to respond to changes in demand. General Electric, Dell Computers, Compaq and other leading firms within the USA successfully introduced this idea within the early 1990's. Since then, many firms within the APO member countries have also introduced SCM practices to satisfy the challenge of the heightened competition.

The concept of Supply Chain Management (SCM) involves the application of state-of-the-art IT tools such as Internet, Intra/Extranet, E-commerce and EDI that greatly help

organizations to simultaneously improve customer service and reduce inventories across the chain. An SCM system works collaboratively with customers, suppliers, trading partners and third parties to change the way operations are viewed, performed and measured. As today's companies focus on gaining economic and competitive advantage throughout the entire product life cycle, this can only be best achieved through leveraging of SCM across the entire enterprise.

Against this background, this program was implemented for the benefits of organizations in the APO member countries, with a view to helping them significantly improve their productivity and competitive performance in the emerging serenity through the effect application of Supply Chain Management principles and practices. In particular, the program provided a platform for the participating member countries to understand the difficulties of developing SCM in APO member countries and to discuss the possible alternatives of treating these difficulties and challenges; and to share their experiences on the practical applications of SCM that have contributed to increasing customer satisfaction, productivity, and competitiveness. The scope of the discussions covered, inter alia, conceptual and theoretical issues related to SCM and logistics strategy, critical elements of world-class supply chain planning, facilitating SCM through internet infrastructure, and technology for the supply chain of the future, building customer focused supply chain, organizational issues in implementation, and recent advances in SCM.

SUPPLY CHAIN MANAGEMENT

Supply Chain Management is the method of designing, Scheduling, implementing, and controlling the operations of the supply chain with the aim to meet customer requirements as efficiently as possible. Supply chain management spans all movement and storage of raw materials, work in process inventory, and finished goods from origin to consumption. Strategy consulting company Booz Allen Hamilton coined the term supply chain management in 1982.

A supply chain could be a network of facilities and distribution that performs the functions of procurement of materials, transformation to processing and finished products, and the distribution of these finished products to customers. Supply chains work on service industry and manufacturing industry, although the complexity of the chain may vary greatly from industry to industry and firm to firm.

Council of Supply Chain Management Professionals, knowledgeable association that developed a definition in 2004, Supply Chain Management "encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, Supply Chain Management integrates supply and demand management within and across companies."

Supply chain event management may be a consideration of all possible occurring events and factors which will cause an interruption during a supply chain. With SCEM possible scenarios are often created and solutions are often planned.

Some experts distinguish supply chain management and logistics management, while others consider the terms to be interchangeable. From the purpose of view of an enterprise, the scope of supply chain management is typically bounded on the availability side by your supplier's suppliers and on the customer side by your customer's customers.

SUPPLY CHAIN DECISIONS

We classify the choices for supply chain management into two broad categories: strategic and operational. As the term implies, strategic decisions are made typically over an extended time horizon. These are closely linked to the company strategy, and guide supply chain policies from a design perspective. On the opposite hand, operational decisions are short term, and specialise in activities over a day-to-day basis. The effort within these sorts of decisions is to effectively and efficiently manage the merchandise flow in the "strategically" planned supply chain.

Shortened product life cycles, increased competition, and heightened expectations of consumers have forced many leading-edge companies to maneuver from physical logistic management towards more advanced supply chain management. Additionally, in recent years it's become clear that a lot of companies have reduced their manufacturing costs the maximum amount because it is practically possible. Therefore, in many cases, the sole possible thanks to further reduce costs and lead times is with effective supply chain management.

In addition to cost reduction, the availability chain management approach also facilitates customer service improvements. It enables the management of inventories, transportation systems and whole distribution networks in order that organizations are able meet or maybe exceed their customers' expectations.

To simplify the concept, supply chain management are often defined as a loop: it starts with the customer and ends with the customer. All materials, finished products, information, and even all transactions flow through the loop. However, supply chain management are often a really difficult task because within the reality, the availability chain may be a complex and dynamic network of facilities and organizations with different, conflicting objectives.

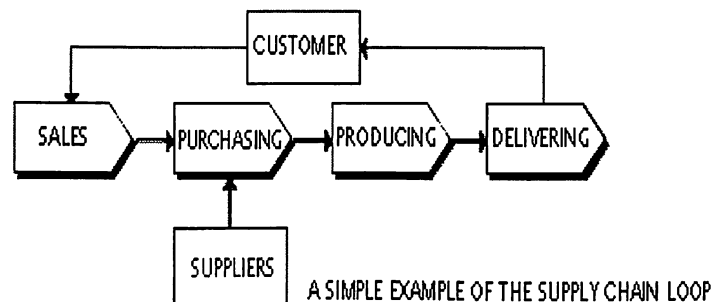


Figure 1.1 Supply Chain Loop

The effective implementation of supply chain management is the rapid developments in information and communications technologies. Use of databases, communication systems, and foremost advanced computer software are crucial for the development of a modern cost-effective supply chain management.

NEED FOR SCM

1. SCM is a concept or a mechanism to improve the total productivity of enterprises in a supply chain by optimizing the timing, location and quantity of materials flow from raw material provider to the consumer of the final products. This concept is especially useful in the industry where (1) the competition in the market is very high, (2) the customers are very demanding for example in the well documented Dell Built-To-Order model where 84% of Dell's revenue is derived from online customers who have the final say in the final configuration of their personal computers and notebooks, (3) the product life cycle is very short for example the electronics contract manufacturing industry currently

experiences product life cycles of short as three months from raw materials to final consumption, and (4) stakeholders request for high returns on investment (ROI). Promising Asian companies should start investing in good IT infrastructure to improve the productivity in the supply chain.

2. There is a need for good SCM systems nationally and regionally for the APO member countries. This system should include databases, model bases, visual maps and friendly user interfaces. The proper use of such a system can help to minimize the total SCM cost (materials cost, production costs, warehousing costs, inventory costs and transportation costs). In ROC and Singapore, there are already such systems in the marketplace and well used by leading enterprises, in electronics and information industries. The benefits of employing such a model can help enterprises in the highly competitive electronic and computer industries to simulate their SCM strategies and determine the optimal SCM strategy under certain cost operating environments.
3. SCM should be linked to the digital economy as demanding and technology savvy customers around the world increasingly expect goods and materials to be delivered to their doorstep at "click-speed". In response to these demands, supply chains of enterprises and industries need to be more real-time and dynamic. Therefore, new technologies, intelligent software agents, will become an integral part of SCM. Quantum leaps in productivity and agility in the supply chain can be made possible by the courageous adoption of these intelligent agent-based decision support systems. The US experience in the use of these software agents has been very successful as these agents (software programs) can actively engage with the user in dialogue, and negotiate and coordinate the transfer of real-time information to other users on web-based platform. Proper interfacing and integration of such agents can help realize the fruition of a truly global logistics network. An example is the establishment of the Global Transport based out of the US. The Transport serves to link manufacturing, transportation and information to create innovative logistical infrastructure for global commerce.
4. In the past, SCM is predominantly enterprise focused with mutually exclusive set of activities. Today, progressive firms are readily embracing systems integration through ERP and other means of electronic connectivity, primarily for cost reduction purposes. In

the future, SCM would have to integrate enterprises, ensure greater collaboration between supply chain partners, work towards a synchronized value collaboration network. Only then can firms talk about chain-wide profit maximization and economic value add.

5. Some of the main challenges presented by the resource persons include the following: building a supply chain infrastructure without damaging the environment i.e. how to have a green supply chain, setting up a reverse logistics program for firms to ensure ecological balance and waste reduction, managing of demand volatility face by enterprises when they move to a digital arena and greater dynamic customization, how to extract better channel coordination between partners in the supply chain, how to obtain better procurement leverage using real-time information and the Internet, how to extract greater profitability out of decreasing business margins, and the need to manage services besides the traditional product-based approach given the blurring between design and outsourcing of manufacturing.
6. Several pertinent concerns were also highlighted by the resource persons: sharing of risk between partners in the supply chain, the ownership of inventory (vendor managed or co-managed inventory), the applicability of some good SCM practice in certain industries (like VMI in the retail sector) to other industries, and information in the supply chain, the management of demand forecast projection and accuracy, and the ability of SMEs to invest in much needed IT and related technologies to improve their supply chain processes
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OPPORTUNITIES ENABLED BY SUPPLY CHAIN MANAGEMENT

The following strategic and competitive areas are often won to their full advantage if a supply chain management system is correctly implemented.

Fulfillment:

Ensuring the right quantity of parts for production or products for sale arrive at the right time. This is enabled through efficient communication, ensuring that orders are placed with the appropriate amount of time available to be filled. The supply chain management system also allows a company to constantly see what is on stock and making sure that the right quantities are ordered to replace stock.

Logistics:

Keeping the cost of transporting materials as low as possible consistent with safe and reliable delivery. Here the supply chain management system enables a company to have constant contact with its distribution team, which could consist of trucks, trains, or any other mode of transportation. The system can allow the company to track where the required materials are at all times. As well, it may be cost effective to share transportation costs with a partner company if shipments are not large enough to fill a whole truck and this again, allows the company to make this decision.

Production:

Ensuring production lines function smoothly because high-quality parts are available when needed. Production can run smoothly as a result of fulfillment and logistics being

implemented correctly. If the correct quantity is not ordered and delivered at the requested time, production will be halted, but having an effective supply chain management system in place will ensure that production can always run smoothly without delays due to ordering and transportation.

Revenue & Profit:

Ensuring no sales are lost because shelves are empty. Managing the supply chain improves a company's flexibility to respond to unforeseen changes in demand and supply. Because of this, a company has the ability to produce goods at lower prices and distribute them to consumers quicker than companies without supply chain management thus increasing the overall profit.

Cost:

Keeping the cost of purchased parts and products at acceptable levels. Supply chain management reduces costs by increasing inventory turnover on the shop floor and in the warehouse, controlling the quality of goods thus reducing internal and external failure costs and working with suppliers to produce the most cost-efficient means of manufacturing a product.

Cooperation:

Supply chain partners ensures mutual success. Collaborative planning, forecasting and replenishment (CPFR) is a longer-term commitment, joint work on quality, and support by the buyer of the supplier's managerial, technological, and capacity development. This relationship allows a company to have access to current, reliable information, obtain lower inventory levels, cut lead times, enhance product quality, improve forecasting accuracy and ultimately improve customer service and overall profits. The suppliers also benefit from the cooperative relationship through increased buyer input from suggestions on improving the quality and costs and though shared savings. Consumers can benefit as well through the higher quality goods provided at a lower cost.

SUPPLY CHAIN MANAGEMENT PROBLEMS

Supply chain management must address the following problems: -

Distribution Network Configuration:

Number and site of suppliers, production facilities, distribution centers, warehouses and customers.

Distribution Strategy:

Centralized versus decentralized, direct shipment, cross docking, pull or push strategies, third party logistics.

Information:

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

Inventory Management:

Quantity and site of inventory including raw materials, work-in-process and finished goods.

SCM ACTIVITIES

Supply chain management is a cross-functional approach to managing the movement of raw materials into an organization and the movement of finished goods out of the organization toward the end-consumer. As corporations strive to focus on core competencies and become more flexible, they have reduced their ownership of raw materials sources and distribution channels. These functions are increasingly being outsourced to other corporations that can perform the activities better or more cost effectively. The effect has been to increase the number of companies involved in satisfying consumer demand, while reducing management control of daily logistics operations. Less control and more supply chain partners led to the creation of supply chain management concepts. The purpose of supply chain management is to improve trust and collaboration among supply chain partners, thus improving inventory visibility and improving inventory velocity.

Strategic

- Strategic network optimization, including the number, location, and size of warehouses, distribution centers and facilities.

- Strategic partnership with suppliers, distributors, and customers, creating communication channels for critical information and operational improvements such as cross docking, direct shipping, and third-party logistics.
- Product design coordination, so that new and existing products can be optimally integrated into the supply chain, load management
- Information Technology infrastructure, to support supply chain operations.
- Where to make and what to make or buy decisions
- Align Overall Organisational Strategy with supply strategy

Tactical

- Sourcing contracts and other purchasing decisions.
- Production decisions, including contracting, locations, scheduling, and planning process definition.
- Inventory decisions, including quantity, location, and quality of inventory.
- Transportation strategy, including frequency, routes, and contracting.
- Benchmarking of all operations against competitors and implementation of best practices throughout the enterprise.
- Milestone Payments

Operational

- Daily production and distribution planning, including all nodes in the supply chain.
- Production scheduling for each manufacturing facility in the supply chain (minute by minute).

- Demand planning and forecasting, coordinating the demand forecast of all customers and sharing the forecast with all suppliers.
- Sourcing planning, including current inventory and forecast demand, in collaboration with all suppliers.
- Inbound operations, including transportation from suppliers and receiving inventory.
- Production operations, including the consumption of materials and flow of finished goods.
- Outbound operations, including all fulfillment activities and transportation to customers.
- Order promising, accounting for all constraints in the supply chain, including all suppliers, manufacturing facilities, distribution centers, and other customers.
- Performance tracking of all activities

OPERATION MANAGEMENT

Operations management is an area of management concerned with overseeing, designing, and controlling the process of production and redesigning business operations in the production of goods or services. It involves the responsibility of ensuring that business operations are efficient in terms of using as few resources as needed, and effective in terms of meeting customer requirements. It is concerned with managing the process that converts inputs (in the forms of raw materials, labor, and energy) into outputs (in the form of goods and/or services). The relationship of operations management to senior management in commercial contexts can be compared to the relationship of line officers to highest-level senior officers in military science. The highest-level officers shape the strategy and revise it over time, while the line officers make tactical decisions in support of carrying out the strategy. In business as in military affairs, the boundaries between levels are not always distinct; tactical information dynamically informs strategy, and individual people often move between roles over time.

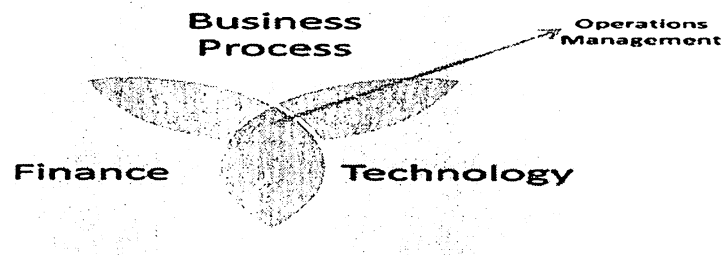


Figure 1.2 Operations Management

Ford Motor car assembly line: the classical example of a manufacturing production system. Operations management studies both manufacturing and services.

According to the United States Department of Education, operations management is the field concerned with managing and directing the physical and/or technical functions of a firm or organization, particularly those relating to development, production, and manufacturing

Operations management programs typically include instruction in principles of general management, manufacturing and production systems, factory management, equipment maintenance management, production control, industrial labor relations and skilled trades supervision, strategic manufacturing policy, systems analysis, productivity analysis and cost control, and materials planning. Management, including operations management, is like engineering in that it blends art with applied science. People skills, creativity, rational analysis, and knowledge of technology are all required for success.

Additionally, The Operations Management Body of Knowledge (OMBOK) Framework defines the scope of operations management and the activities and techniques that are a part of the operations management profession.

Operations also refer to the production of goods and services, the set of value-added activities that transform inputs into many outputs. Fundamentally, these value-adding creative activities should be aligned with market opportunity for optimal enterprise performance.

Operations as a Transformation Process

1. Inputs
2. Transformation
3. Output

Operations management is about the way organizations produce goods and services. Everything you wear, eat, sit on, use, read or knock about on the sports field comes to your courtesy of the operations managers who organized its production. Every book you borrow from the library, every treatment you receive at the hospital, every service you expect in the shops and every lecture you attend at university all have been produced.

This definition reflects the essential nature of Operations Management; it is a central activity in organizing things. Another way of looking at an operation is to consider it as a transformation process.

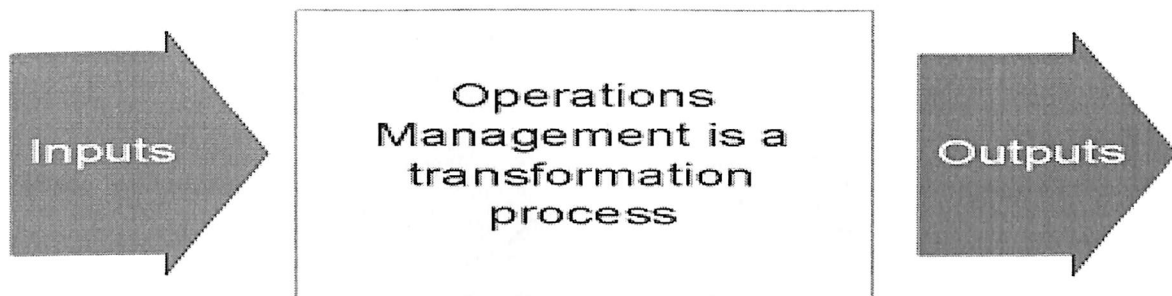


Figure 1.3 Transformation Process

Operations are a transformation process; they convert a set of resources (INPUTS) into services and goods (OUTPUTS). These resources may be raw materials, information, or the customer itself. These resources are transformed into the final goods or services by way of other 'transforming' resources - the facilities and staff of the operation.

- **Raw Materials**

An obvious example is a cabinet maker, who takes some wood, cuts and planes it, and then polishes it until a piece of furniture is produced.

- **Information**

A tourist office gathers and provides information to holiday makers, and assists in advising on places to stay or visit.

- **Customers**

At an airport, you are one of the many resources being processed. The operation you are involved in is about processing your ticket and baggage, moving from ticket desk through the customs and duty-free areas, to deliver you to the awaiting plane.

Operations is about designing services, products and delivery systems;

1. Managing and controlling the operations system.
2. Finding ways to improve operations.

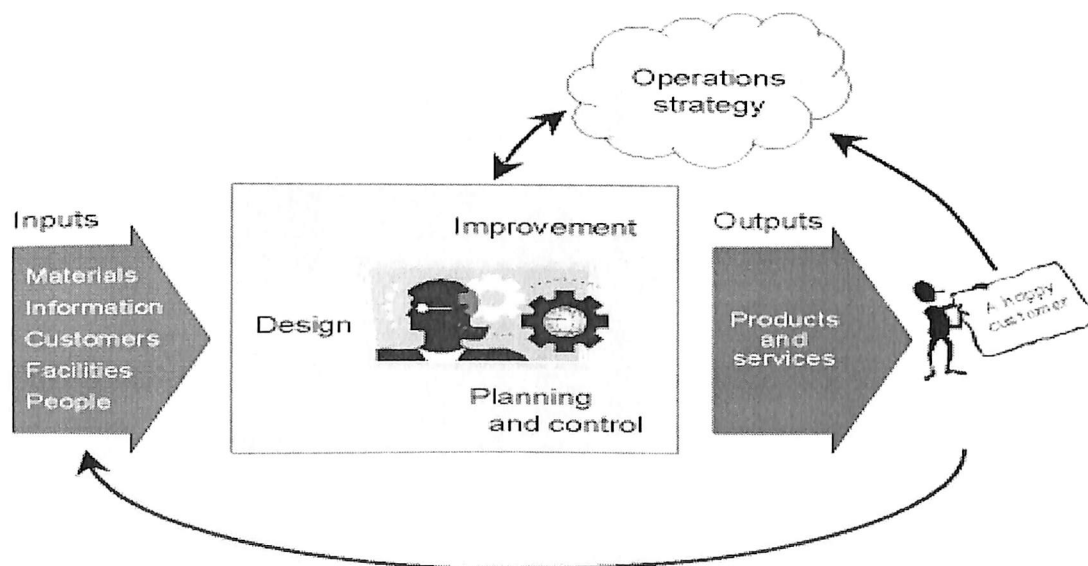


Figure 1.4 Operations Strategy

Operations Management is all about providing customers with products and services.

You survive by giving customers with what they want

- Every Product or Service is really a bundle of different attributes.
 - Product, place, price, performance, quality, timing, service, etc.
 - Customers are looking for a bundle of characteristics
 - Total bundle provides the level of value customers deem appropriate
 - Buying products with the attributes they want at the lowest price possible
-
- ✓ Attributes
 - ✓ Price
 - ✓ Quality
 - ✓ Image
 - ✓ Performance
 - ✓ Safety
 - ✓ Place – distribution
 - ✓ Time – delivery, availability
-
- How do you decide which product to produce?
 - How do you find out what attributes your product should have?
 - How do you get those attributes into your product?
 - What process?
 - What resources do you need?
 - Where do you get those resources?

Examples of Operations Decisions

Operations managers must make decisions on three levels

- Strategic
- Tactical
- Operating

STRATEGIC DECISIONS:

- Longer term decisions
- Usually made at the senior management level
- Product and service strategy
- Competitive priorities
- Positioning strategy
- Location, capacity
- Long term partnerships
- Quality system and overall approach to quality

TACTICAL DECISIONS

- Medium term decisions
- Tactical in nature
- Made by middle and senior managers
- Process design
- Technology management
- Job design and workforce management
- Capacity management

- Facility location
- Facility layout

OPERATING DECISIONS

- Shorter term decisions
- Made at middle and lower management levels
- Forecasting
- Materials management
- Inventory management
- Aggregate planning
- Master production scheduling
- Production control
- Scheduling

Logistics

Logistics is the total process of planning, implementing, and coordinating the physical movement of merchandise from manufacturer to retailer to customer in the timeliest, effective and cost-efficient manner possible. If it works well, firms reduce stockouts, hold down inventories, and improve customer service

Goals of Logistics

- ✓ Relate the costs incurred to specific logistics activities, thereby fulfilling all activities as economically as possible, given the firms' other performance objectives
- ✓ Place and receive orders as easily, accurately, and satisfactorily as possible
- ✓ Minimize the cost between ordering and receiving merchandise

- ✓ Coordinate shipments from various suppliers
- ✓ Have enough merchandise in hand to satisfy customer demand, without having so much inventory that heavy markdowns will be necessary
- ✓ Place merchandise on the sales floor efficiently
- ✓ Process customer orders efficiently and in a manner satisfactory to customers
- ✓ Work collaboratively and communicate regularly with other supply chain members
- ✓ Handle returns effectively and minimize damaged products
- ✓ Monitor logistics Performance
- ✓ Have backup plans in case of breakdown in system

The Historical Development of Operations Management

Operations in some form has been around as long as human endeavor itself but, in manufacturing at least, it has changed dramatically over time, and there are three major phases - craft manufacturing, mass production and the modern period. Let's look at each of these briefly in turn. Operations in some form has been around as long as human endeavor itself but, in manufacturing at least, it has changed dramatically over time, and there are three major phases - craft manufacturing, mass production and the modern period. Let's look at each of these briefly in turn.

Mass production

In many industries, craft manufacturing began to be replaced by mass production in the 19th century. Mass production involves producing goods in high volume with low variety – the opposite of craft manufacturing. Customers are expected to buy what is supplied, rather than goods made to their own specifications. Producers concentrated on keeping costs, and hence prices, down by minimising the variety of both components and products and setting up large

production runs. They developed aggressive advertising and employed sales forces to market their products.

An important innovation in operations that made mass production possible was the system of standardised and interchangeable parts known as the 'American system of manufacture' (Hounshell, 1984), which developed in the United States and spread to the United Kingdom and other countries. Instead of being produced for a specific machine or piece of equipment, parts were made to a standard design that could be used in different models. This greatly reduced the amount of work required in cutting, filing and fitting individual parts, and meant that people or companies could specialise in particular parts of the production process.

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The modern period

Mass production worked well as long as high volumes of mass-produced goods could be produced and sold in predictable and slowly changing markets. However, during the 1970s, markets became highly fragmented; product life cycles reduced dramatically and consumers had far greater choice than ever before.

An unforeseen challenge to Western manufacturers emerged from Japan. New Japanese production techniques, such as total quality management (TQM), just-in-time (JIT) and employee involvement were emulated elsewhere in the developed world, with mixed results.

More recently, the mass production paradigm has been replaced, but there is as yet no single approach to managing operations that has become similarly dominant. The different approaches for managing operations that are currently popular include:

Flexible specialisation (Piore and Sabel, 1984) in which firms (especially small firms) focus on separate parts of the value-adding process and collaborate within networks to produce whole products. Such an approach requires highly developed networks, effective processes for collaboration and the development of long-term relationships between firms.

Lean production (Womack et al., 1990) which developed from the highly successful Toyota Production System. It focuses on the elimination of all forms of waste from a production system. A focus on driving inventory levels down also exposes inefficiencies, reduces costs and cuts lead times.

Mass customisation (Pine et al., 1993) which seeks to combine high volume, as in mass production, with adapting products to meet the requirements of individual customers. Mass customisation is becoming increasingly feasible with the advent of new technology and automated processes.

Agile manufacturing (Kidd, 1994) which emphasises the need for an organisation to be able to switch frequently from one market-driven objective to another. Again, agile manufacturing has only become feasible on a large scale with the advent of enabling technology.

In various ways, these approaches all seek to combine the high volume and low cost associated with mass production with the product customisation, high levels of innovation and high levels of quality associated with craft production.

The Role of the Operations Manager

The professionally involved in operations management argue that operations management involves everything an organisation does. In this sense, every manager is an operations manager, since all managers are responsible for contributing to the activities required to create and deliver an organisation's goods or services. However, others argue that this definition is too wide, and that the operations function is about producing the right amount of a good or service, at the right time, of the right quality and at the right cost to meet customer requirements.

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So operations managers are responsible for managing activities that are part of the production of goods and services. Their direct responsibilities include managing both the operations process, embracing design, planning, control, performance improvement, and operations strategy. Their indirect responsibilities include interacting with those managers in other functional areas within the organisation whose roles have an impact on operations. Such areas include marketing, finance, accounting, personnel and engineering.

Operations managers' responsibilities include:

Human resource management:

The people employed by an organisation either work directly to create a good or service or provide support to those who do. People and the way they are managed are a key resource of all organisations.

Asset Management:

An organisation's buildings, facilities, equipment and stock are directly involved in or support the operations function.

Cost management:

Most of the costs of producing goods or services are directly related to the costs of acquiring resources, transforming them or delivering them to customers. For many organisations in the private sector, driving down costs through efficient operations management gives them a critical competitive edge. For organisations in the not-for-profit sector, the ability to manage costs is no less important.

Decision Making:

Decision making is a central role of all operations managers. Decisions need to be made in:

Designing the operations system Managing the operations system Improving the operations system.

1. The processes by which goods and services are produced
2. The quality of goods or services
3. The quantity of goods or services (the capacity of operations)
4. The stock of materials (inventory) needed to produce goods or services
5. The management of human resources.

Decision Making is a central role of all operations managers. Decisions need to be made in: designing the operations system managing the operations system improving the operations system. The five main kinds of decision in each of these relate to: the processes by which goods and services are produced the quality of goods or services the quantity of goods or services (the capacity of operations) the stock of materials (inventory) needed to produce goods or services the management of human resources.

The Transformation models

The discussion above has highlighted the role of operations in creating and delivering the goods and services produced by an organisation for its customers. This section introduces the transformation model for analysing operations. This is shown in Figure 1, which represents the three components of operations: inputs, transformation processes and outputs. Operations management involves the systematic direction and control of the processes that transform resources (inputs) into finished goods or services for customers or clients (outputs). This basic transformation model applies equally in manufacturing and service organisations and in both the private and not -for-profit sectors.

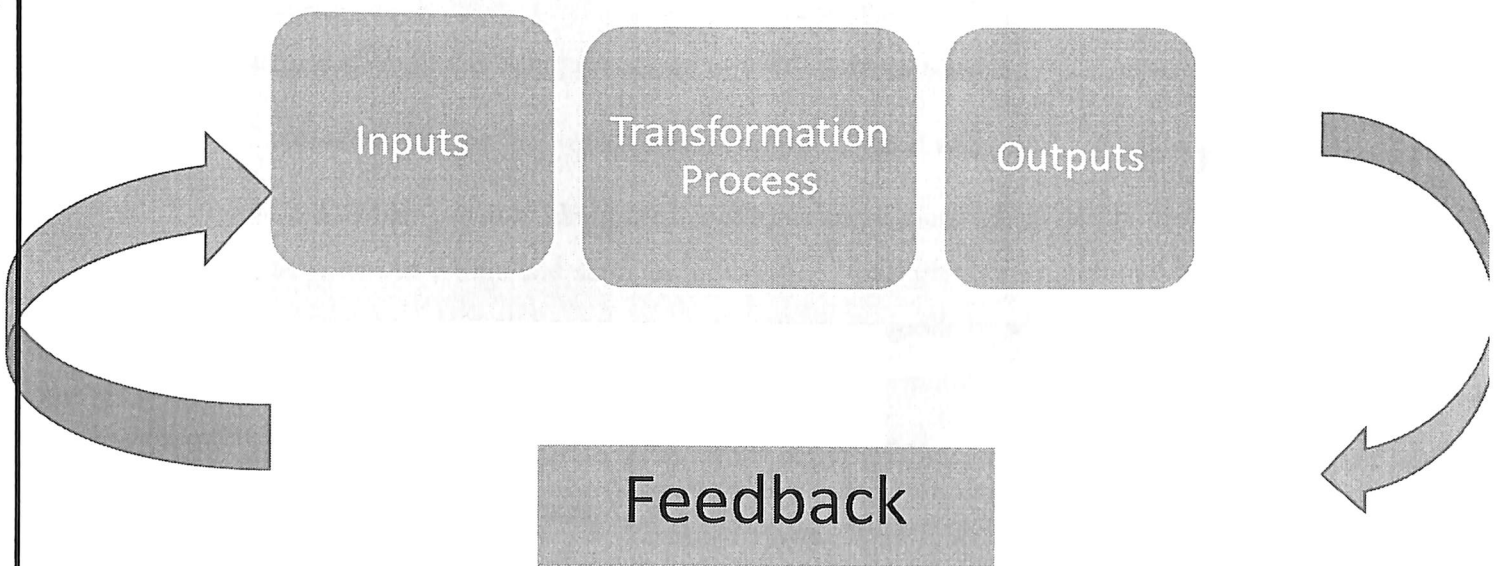


Figure 1.5 Transformation Models

Inputs

Some inputs are used up in the process of creating goods or services; others play a part in the creation process but are not used up. To distinguish between these, input resources are usually classified as:

Transformed Resources:

Those that are transformed in some way by the operation to produce the goods or services that are its outputs

Transforming Resources – those that are used to perform the transformation process. Inputs include different types of both transformed and transforming resources.

Three types of resource that may be transformed in operations are:

- **Materials** – the physical inputs to the process
- **Information** that is being processed or used in the process
- **Customers** – the people who are transformed in some way.

Operations as being mainly about the transformation of materials or components into finished products, as when limestone and sand are transformed into glass or an automobile is assembled from its various parts. But all organisations that produce goods or services transform resources: many are concerned mainly with the transformation of information.

Galloway (1998) defines operations as all the activities concerned with the transformation of materials, information or customers.

The two types of transforming resource are:

Staff:

The people involved directly in the transformation process or supporting it Facilities – land, buildings, machines and equipment.

The staff involved in the transformation process may include both people who are directly employed by the organisation and those contracted to supply services to it. They are sometimes described as 'labour'. The facilities of an organisation – including buildings, machinery and equipment are sometimes referred to as 'capital'. Operations vary greatly in the mix of labour and capital that make up their inputs. Highly automated operations depend largely on capital; others rely mainly on labour.

Some inputs are used up in the process of creating goods or services; others play a part in the creation process but are not used up. To distinguish between these, input resources are usually classified as transformed resources – those that are transformed in some way by the operation to produce the goods or services that are its outputs transforming resources those that are used to perform the transformation process. Inputs include different types of both transformed and transforming resources. Three types of resource that may be transformed in operations are: materials – the physical inputs to the process information that is being processed or used in the process customers – the people who are transformed in some way.

Many people think of operations as being mainly about the transformation of materials or components into finished products, as when limestone and sand are transformed into glass or an automobile is assembled from its various parts. But all organisations that produce goods or services transform resources: many are concerned mainly with the transformation of information or the transformation of customers.

Outputs

The principal outputs of a doctor's surgery are cured patients; the outputs of a nuclear reprocessing plant include reprocessed fuel and nuclear waste. Many transformation processes produce both goods and services. For example, a restaurant provides a service, but also produces goods such as food and drinks.

Transformation processes may result in some undesirables well as the goods and services they are designed to deliver. An important aspect of operations management in some organisations is minimising the environmental impact of waste over the entire life cycle of their products, up to the point of final disposal. Protecting the health and safety of employees and of the local community is thus also the responsibility of operations management. In addition, the

operations function may be responsible for ethical behaviour in relation to the social impact of transformation processes, both locally and globally. For example, in the United States, manufacturers of sports footwear have come under fire for employing child labour and paying low wages to workers employed in their overseas factories.

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CHAPTER 2

REVIEW OF LITERATURE

Literature review focuses on SCM & Pricing of Petroleum Products, Literature Related to Supply Chain Management, Petroleum Industry in India, Pricing Policies of Petroleum Products in India are presented. Other factors affecting the SCM & Pricing of Petroleum Products Such as SCM Software, MIS, Geographical & Political Challenges Related to Import of Crude Oil, etc. are also presented.

1. Sunil Chopra & Peter Meindl, (2003), Supply Chain Management: Strategy, Planning, and Operations, Prentice Hall; 2nd Edition, ISBN-10:0131010284, ISBN-13:978-0131010284

Sunil Chopra & Peter Meindl Discusses in this book the strategic role of the supply chain, key strategic drivers of supply chain performance and the tools and techniques for supply chain analysis. The Authors identify inventory, transportation, information, and facilities as the key drivers of supply chain performance. This book then conveys how these drivers may be used on a conceptual level during supply chain design, planning, and operation to improve performance. For each driver of supply chain performance, the goal is to provide practical managerial levers and concepts that may be used to improve supply chain performance.

2. Peter Bolstorff & Robert Rosenbaum, (2003), Supply Chain Excellence: A Handbook for Dramatic Improvement Using the SCOR Model, Amacom, 1st edition, ISBN-10: 0814407307, ISBN-13: 978-0814407301

This book discusses implementing new supply chain projects using the official techniques of The Supply Chain Council. It provides step-by-step guidelines of the entire Supply Chain Operations Reference (SCOR) Model, showing how to align workflow, define business opportunity, use metrics to determine success, and gain internal support. Besides the guideline on step-by-step process for completing a successful project, it has a built-in timeline to assist you in accurately projecting when a project will begin to reap the benefits of reshaping your supply chain. Utilizing the process steps as outlined will result in a project portfolio of recommended improvements which will be easy to prioritize based on the rating system included in the process.

3. Janat Shah, (2009), Supply Chain Management: Text and Cases, Pearson Education Publications, 1st Edition, ISBN-13: 9788131715178

Supply Chain Management: Text and Cases, integrates concepts and application to turn the spotlight on innovations. The Author presents the concept of SCM using illustrative examples, caselets and case studies from the Indian context. Divided into five parts, this book presents numerous examples and caselets, thus blending concepts with current industrial practices and state-of-the-art know-how, for enhanced understanding and a holistic view of supply chain management. A complete part of the book is devoted to innovations in supply chain management that may be used by firms operating in competitive markets to improve their performance.

4. Larry Paquette, (2003), The Sourcing Solution: A Step-by-Step Guide to Creating a Successful Purchasing Program, Amacom Publication, ISBN-10: 0814471919, ISBN-13: 978-0814471913.

The Author brings forth that globalization and rapidly evolving technologies have accelerated and refined the procurement function in every industry and at every scale. 'The Sourcing Solution' presents an overview of new sourcing strategies & tools. It offers clear overview of the new tools of sourcing success, including e-commerce and Internet strategies, supply-chain management technology, inventory auction sites, strategic sourcing initiatives, offshore and international sourcing.

5. Vinod V. Sople, (2012), Supply Chain Management: Text and Cases, Pearson Education Publications, ISBN-13: 9788131760994.

The book addresses the issues of Supply Chain Management in seven parts, which deal with the basics of the supply chain, sub-systems of the supply chain, tactical and operational decisions and strategic approach to the supply chain, measurements, controls and sustainability practices. The author has used diagrams and examples for better explanation of the concepts. A part devoted to 15 comprehensive case studies is included of Indian companies such as Ambuja Cement Ltd, United Art Logistics, ShriMahilaGrihaUdyogLijjatPapad Cooperative Society, ITC Limited, Zapak Ltd, etc.

6. Terence T. Burton & Steven Broeder, (2003), The Lean Extended Enterprise: Moving Beyond the Four Walls to Value Stream Excellence, J Ross Publications, ISBN-10: 1932159126, ISBN-13: 978-1932159127

The book provides a great reference model ("Lean Extended Enterprise Reference Model-LEERM") for understanding the structure and framework for assisting companies, their customers, and suppliers in transitioning to a total value stream conversion to lean. This Book goes beyond addressing the applications of lean tools such as, Kanban, SMED, etc, and discusses the entire methodology for implementing such tools. The authors discuss how to integrate the total value stream — vertically, horizontally, and laterally and achieve success through empowered people and teams, cultural transformation, and an integration of Lean, Six Sigma, Kaizen, and enabling technologies such as ERP, SCM, APS, CRM, PLM, networks, exchangers, and portals. Using the Lean Extended Enterprise Reference Model (LEERM), the authors demonstrate that by deploying the right methodologies and technologies to the right situation you can achieve huge breakthroughs in performance.

7. Sonia Shah (2004), Crude: The Story of Oil, Seven Stories Press, ISBN-10: 1583226257.

The Author Present unexpurgated story of oil, from the circumstances of its birth millions of years ago to the spectacle of its rise as the indispensable ingredient of modern life. It then brings forth the Geographical and political challenges of Oil.

8. Donald Bowersox, David Closs& M. Bixby Cooper, (2002), Supply Chain Logistics Management, McGraw-Hill/Irwin, ISBN-10: 0072351004, ISBN13: 978-0072351002.

‘Supply Chain Logistics Management’ examines traditional logistics issues within the context of the supply chain. This Book studies internal functions of an organization with inclusion of issues that relate to the entire supply chain. ‘Supply Chain Logistics Management’, provides a solid foundation that clearly describes the role of logistics within the supply chain, portraying a complete view of the subject and going farther to show how all the pieces fit together. The authors of the book discuss Supply Chain Logistics Management with a lot of industrial insights as supporting cases.

9. AnanthIyer, Sridhar Seshadri& Roy Vasher, (2009), Toyota Supply Chain Management: A Strategic Approach to Toyota's Renowned System, McGraw Hill, ISBN-10: 0071615490.

'The Toyota Production' System is the benchmark used throughout the world for "lean" thinking. The authors of the book, being industry insiders and former Senior Executive of Toyota, describe in detail 'Toyota's Supply Chain', explaining the operations and the logic behind them. The Book help you design and oversee significant improvements to your supply chain, including Sales planning, Production scheduling, Supplier Management, Logistics, Parts ordering, Demand fulfillment. The authors pool their extensive and well-rounded knowledge to provide "how-to" insights for applying the lessons of Toyota in any industry. Using enables readers to create operational efficiency by better connecting offices, plants, facilities, and vendors.

10. David Blanchard, (2010), Supply Chain Management Best Practices, Wiley, 2nd edition, ISBN-10: 0470531886, ISBN-13: 978-0470531884.

This Books Demonstrates how to build supply chains that works, by illustrating how leading companies are doing it. Identifying world-class supply chains in more than a dozen different industries and explaining in detail how these companies got to where they are. This book reveals the proven strategies, solutions, and performance metrics used by leading companies to design their extended enterprises. It also offers guidance on the latest technology, green supply chains, going lean, how to choose third-party logistics providers, and how to manage the supply chain in a global environment.

11. Shoshanah Cohen & Joseph Roussel, (2004), Strategic Supply Chain Management, McGraw-Hill, ISBN-10: 0071432175, ISBN-13: 978- 0071432177.

Strategic Supply Chain Management explores the knowledge, techniques, and strategies necessary to create value and achieve competitive advantage from your supply chain. The Books Demonstrates How today's industry leaders are building supply chain efficiencies and creating long-term competitive advantage. The Authors offer In-depth and illustrative profiles of seven leading and distinct supply chain organizations, ranging from Eli Lilly to the U.S. Department of Defense. It Also Discusses Strategies built around the Supply Chain Operations Reference-model (SCOR) for increasing both the internal and external productivity of your company's supply chain. It Provides Guidelines for assessing and improving a company's interaction with its supply chain partners.

12. David Simchi-Levi, Philip Kaminsky, Edith Simchi-Levi, (2003), Managing the Supply Chain: The Definitive Guide for the Business Professional, McGraw-Hill, ISBN-10: 0071410317, ISBN-13: 978- 0071410311

This results-based book examines the experiences of today's most accomplished companies to demonstrate supply-chain innovation at work in the marketplace. The Authors of the books presents case studies on Innovative Supply Chain Management of the leading companies like Coca cola, Walmart, dell, Amazon, etc.

13. VivekSehgal, (2009), Enterprise Supply Chain Management: Integrating Best in Class Processes, Wiley; 1 edition, ISBN-10: 0470465455, ISBN-13: 978-0470465455.

This Book offers a comprehensive look at the role of SCM within an organization. It demonstrates how to manage a supply chain across an enterprise, encompassing technological, financial, procurement, and operational issues. It Covers A primer on supply chain and finance, Elements of a supply chain model, The scope of the supply chain, Demand and supply planning, Supply chain network design, Transportation and warehouse management, Supply chain collaboration, Reverse logistics management, Supply chain technology. It clearly explains how each process works and the relationship between them.

14. R. Basu, (2011), Managing Project Supply Chains, Gower Publications, ISBN-10: 1409425150.

"Managing Project Supply Chains" demonstrates how customized supply chain management can be applied to Project Management, ensuring project resources are delivered as required, reducing delays and costs and promoting a successful outcome.

15. Jeffrey P. Wincel, (2003), Lean Supply Chain Management: A Handbook for Strategic Procurement, Productivity Press, ISBN-10:156327289X, ISBN-13: 978-1563272899.

The Author of the book considers an organization's "business condition" as a contributing factor in the development of a strategic procurement strategy. That is, rather than taking a "one-size fits all" approach, the author's more individualized approach illustrates techniques specific to organizations operating in a standard or crisis environment. The Author Discusses, Methods for

developing and tracking strategic procurement initiatives, planning in the "standard" and "crisis" environments.

16. Mandyam M. Srinivasan, (2004), Streamlined: 14 Principles for Building & Managing the Lean Supply Chain, South-Western Educational Publications, ISBN-10: 0324232772, ISBN-13: 978-0324232776

Focusing on the lean supply chain from an operations perspective, this insightful book offers a thorough overview, covering the activities of all the companies involved in the flow of products, services, finances, and information - from the initial suppliers to the ultimate users. It provides candid discussions of managers' tasks and responsibilities and how they may be best accomplished through the use of such conceptual tools as lean thinking, theory of constraints, and the balanced scorecard. The book integrates the discussion of theory of constraints with the lean supply chain, illustrating how both champion the use of pull to create the flow of goods and services through the value chain while emphasizing that lean is indeed a growth strategy.

17. Martin Christopher, (2005), Logistics & Supply Chain Management: Creating Value-Adding Networks, FT Press, 3rd edition, ISBN-10: 0273681761, ISBN-13: 978-0273681762

This text discusses the role of logistics in achieving corporate and financial goals. It introduces the practitioner to some of the frontiers of strategically driven service response logistics such as, how to design, deploy and organize integrated SCM for corporate strategic reasons & for functional cost control.

18. R.P. Mohanty & S.G. Deshmukh, (2009), Supply Chain Management: Theories & Practices, Biztantra Publications, 2nd edition, ISBN10: 81- 7722-191-4, ISBN13: 978-81-7722-191-6

The Book Address Supply Chain Management as it concerns with the 'Integration' of firms in the face of coordinating materials and information flows within a procurement-production-distribution network in order to attain the enterprise's goals. The book emphasizes on improving the efficiency of supply chain management with the usage of information technology.

19. Hartmut Stadtler & Christoph Kilger, (2004), SCM & Advanced Planning: Concepts, Models, Software and Case Studies, Springer Publications, 3rd edition, ISBN-10: 3540220658, ISBN-13: 978- 3540220657.

This book provides insights regarding the concepts of Enterprise Resources Planning (ERP) systems being used for transaction handling and order execution in most firms today that have been supplemented by Advanced Planning Systems (APS) for coordinating flows, exploiting bottlenecks and keeping due dates. Special emphasis is given to modeling supply chains and implementing Advance Planning System in industry successfully. The Book offers six case studies covering a wide range of industrial sectors and ideas to implement APS successfully.

20. David J. Piasecki, (2003), Inventory Accuracy: People, Processes & Technology, Inventory Operations Consultant Publications, ISBN-10: 0972763104.

Inventory Accuracy: People, Processes & Technology provides a comprehensive treatment of inventory accuracy in distribution, fulfillment, and manufacturing environments. The Book provides with details on physical inventories, process evaluation, training, accountability, and various technologies including bar codes, voice technology, RFID, and light-directed systems. In addition to documenting the standard tools and techniques used to achieve accuracy, the author provides insights as to why many of the standard solutions don't provide the best results and offers alternative methods. The focus on practical solutions that take into account the sometimes-conflicting priorities that affect accuracy, results in an approach that not only looks good on paper, but more importantly, works in the real world.

21. Mahadeo Jaiswal & Ganesh Vanapalli, A Text Book on Enterprise Resource Planning (2005), Macmillan Publishers India, 1st Edition, ISBN: 9781403927453

The Authors of the Book present concepts which helps understand the benefits and nuances of the modern ERP system. The Book gives detail information of Implementation of ERP for a fully integrated business system covering each and every aspect of a business such as materials, production, sales & distribution, plant maintenance, quality management, project management, production planning, accounting and Human Resources.

CHAPTER 3

RESEARCH DESIGN, METHODOLOGY AND PLAN

Research methodology is a way to systematically solve the research problems. It guides the researcher to do the research scientifically. It contains of different steps that are generally adopted by a researcher to study his research problem along with the logic behind them. Data become information only when a proper methodology is adopted. The research methodology includes the logic behind the methods we use in the content of our research study.

3.1 RESEARCH DESIGN

A research design is the arrangement of condition for collection and analysis of data in a manner which may result in an economy in procedure. It stands for advance planning for collection of the relevant data and the techniques to be used in analysis, keeping in view the objective of the research availability of time.

There are three types of research designs. They are,

- Exploratory research design.
- Conclusive research design.
 1. Descriptive research design.
 2. Causal research design.
- Performance monitoring research.

The Research design used in this study was descriptive research design. It includes surveys and fact-finding enquiries of different kinds. The main characteristic of this method is that the researcher has no control over the variables; he can report only what has happened or what is happening.

3.2 SAMPLING TECHNIQUES

The simple random sampling technique was employed in the selection of the sample.

SAMPLE SIZE

100

DATA COLLECTION METHOD

The data collection method for the study the researcher should keep in the mind the two sources of data.

- Primary data
- Secondary data.

PRIMARY DATA COLLECTION

Source of Primary data:

1. Experimentation
2. Observation
3. Questionnaire schedule

Primary data has been collected through structured questioner. The questionnaire consisted of a variety of questions that lay consistent with the objective of the research.

➤ Questionnaire

The questionnaire was prepared keeping in view the objectives of study. Different questions were so arranged to know Supply Chain Management of IndianOil Skytanking Pvt. Ltd. The questionnaire not only focused gathering information on the above mentioned areas but also about the service suggestions to be envisaged under support, update and engage.

Questionnaire contains four types of questions

1. Open Ended
2. Dichotomous
3. Fixed Alternative Question

3.3 SURVEY QUESTIONS

1. Gender
 - a) Male
 - b) Female
2. Age group
 - a) 18-25 years
 - b) 26-35 years
 - c) 36-45 years
 - d) 45 years and above
3. Marital Status
 - a) Married
 - b) Unmarried
4. Family size
 - a) Joint
 - b) Nuclear
5. Monthly Income (in Rs.)
 - a) Less than 20,000
 - b) 20,000 – 30,000
 - c) 30,000 – 40,000
 - d) More than 40,000
6. Our organisation rely on few dependable suppliers.
 - a) Strongly agree
 - b) Agree
 - c) Neither agree nor disagree
 - d) Disagree
 - e) Strongly disagree
7. Our organisation consider quality as number one criterion in selecting suppliers.
 - a) Strongly agree
 - b) Agree
 - c) Neither agree nor disagree
 - d) Disagree

- e) Strongly disagree
- 8. Our organisation strive to establish long term relationship with its suppliers.
 - a) Strongly agree
 - b) Agree
 - c) Neither agree nor disagree
 - d) Disagree
 - e) Strongly disagree
- 9. Our organisation helps its suppliers to improve their product quality.
 - a) Strongly agree
 - b) Agree
 - c) Neither agree nor disagree
 - d) Disagree
 - e) Strongly disagree
- 10. Your organisation include its key suppliers in its planning and goal setting activities.
 - a) Strongly agree
 - b) Agree
 - c) Neither agree nor disagree
 - d) Disagree
 - e) Strongly disagree

3.4 INTERVIEW PROCEDURES

STUDY CONDUCTED

The primary data was gathered through personal interaction. The information was gathered from the structured questionnaire.

SECONDARY DATA:

Secondary data has been collected from the Company Website, Internet and More.

3.5 DATA ANALAYSIS PROCEDURES

Simplex percentage analysis:

Percentage analysis is the method to represent raw streams of data as a percentage (a part in 100- percent) for better understanding of collected data.

Graphs:

Graphical representations are used to show the results in simple form. The graphs are prepared on the basis of data that is received from the percentage analysis.

LIMITATION OF THE STUDY

- Study is limited to Indian Oil Skytanking
- Time period is limited to 4 weeks
- The company may not disclose and provide data for their confidentiality purposes.

CHAPTER 4

FINDINGS AND ANALYSIS

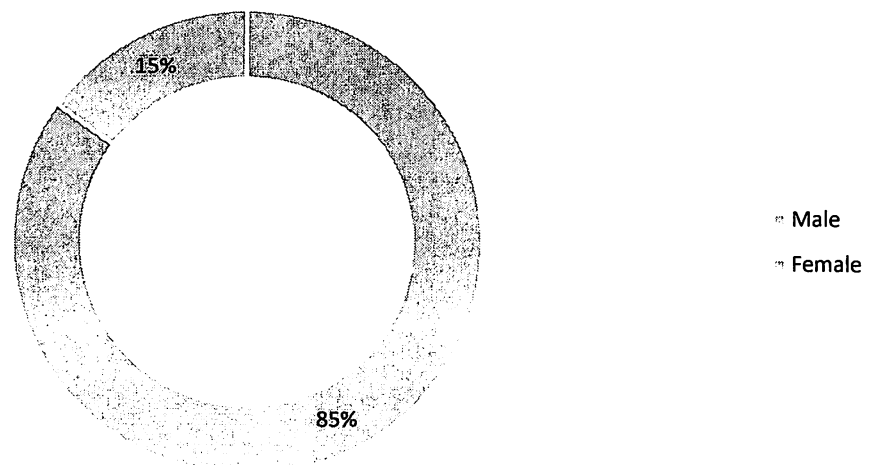
1. Gender of Respondents

Table no. 4.1 Gender of Respondents

Gender	No. of Respondents	Percentage
Male	67	67%
Female	33	33%
Total	100	100%

Chart no. 4.1 Gender of Respondents

Gender



Interpretation:

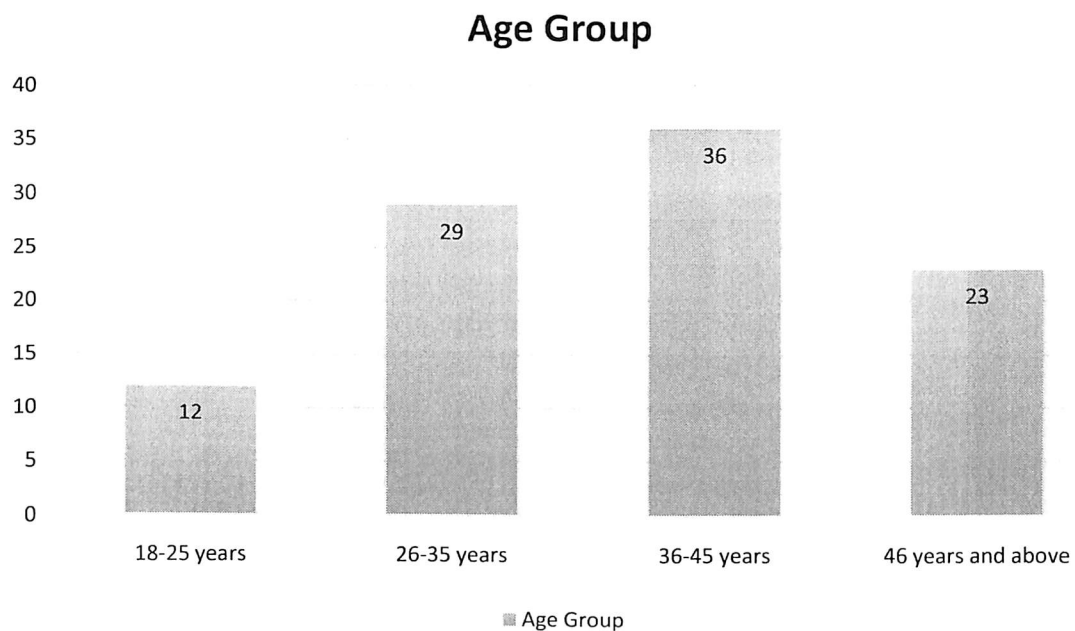
From the above table it is clear that 67% of the respondents are male and 33% are females.

2. Age of the respondents

Table no. 4.2 Age of the respondents

Age group	No. of Respondents	Percentage
18-25 years	12	12%
26-35 years	29	29%
36-45 years	36	36%
46 years and above	23	23%

Chart no. 4.2 Age of the respondents



Interpretation:

The above table gives us a description about the age group of the 100 respondents included for the study and it reveals that 36% of the respondents are of the age group of 36-45 years, 29% are 26-35 years' age group, 23% are 46 years and above and 12% of the respondents are of the age group of 18-25 years.

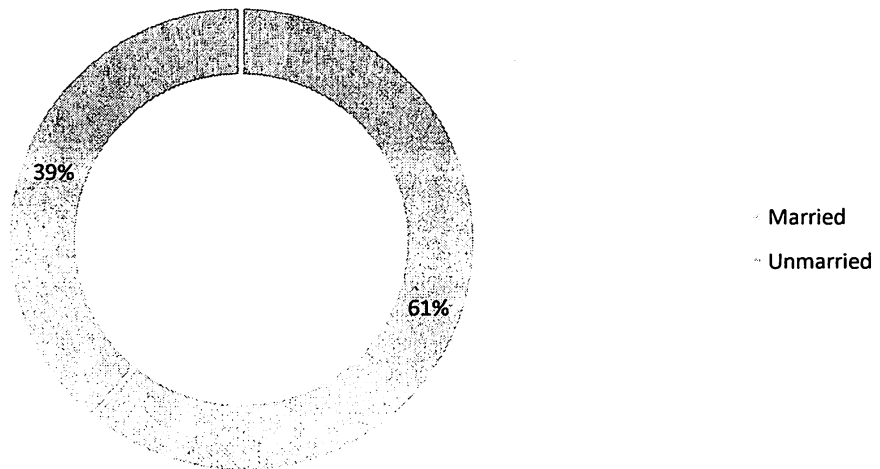
3. Marital Status of the Respondents

Table no. 4.3 Marital Status of the Respondents

Marital Status	No. of Respondents	Percentage
Married	61	61%
Unmarried	39	39%

Chart no. 4.3 Marital Status of the Respondents

Marital Status



Interpretation:

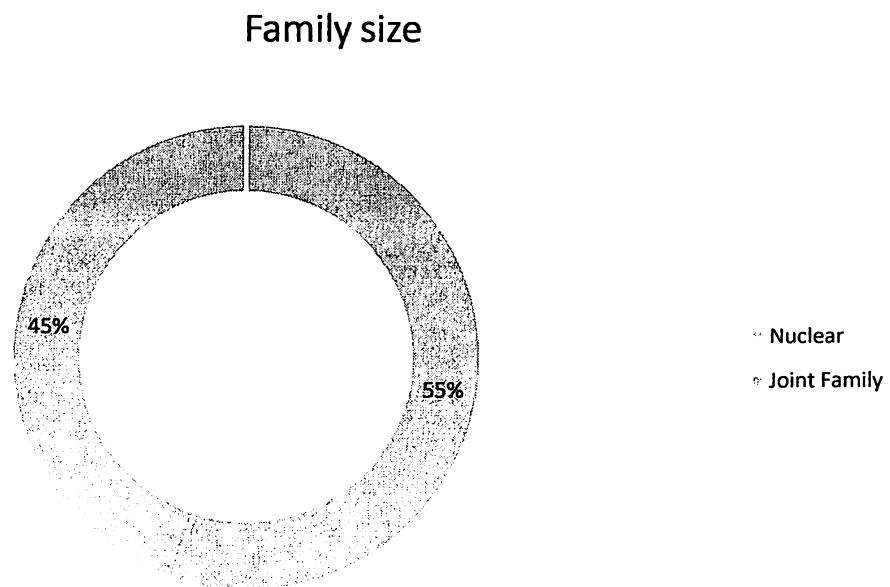
From the above table it can be seen that 61% of the respondents are married and 39% of the respondents are unmarried.

4. Family Size of the Respondents

Table no. 4.4 Family size of the Respondents

Family size	No of Respondent	Percentage
Nuclear	55	55%
join family	45	45%
Total	100	100%

Chart no. 4.4 Family size of the Respondents



Interpretation:

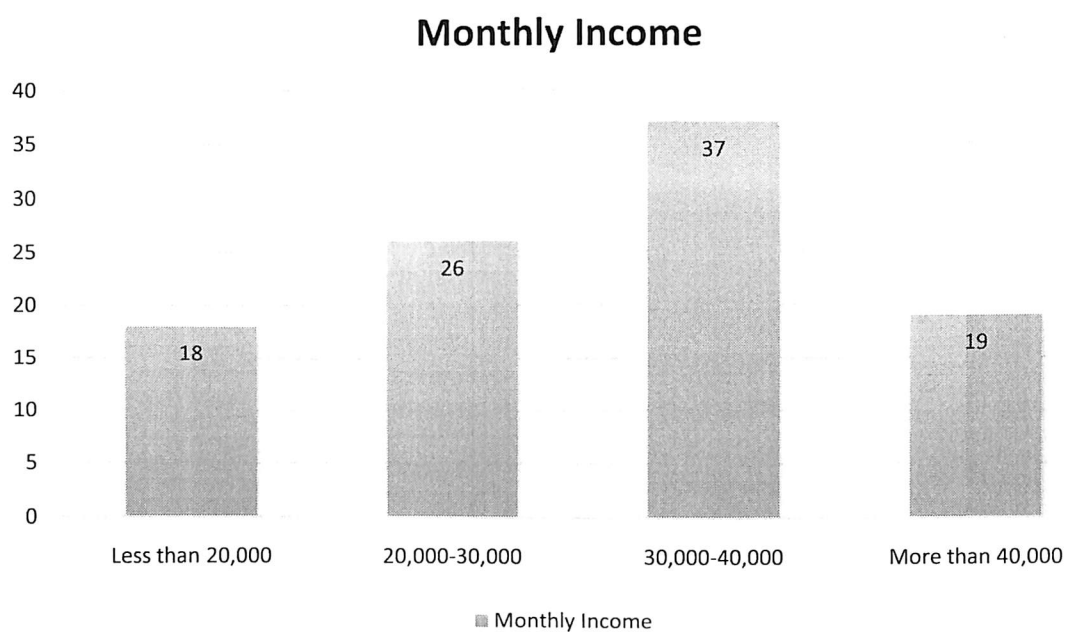
The above table shows that 55% of the respondents are from nuclear family, and 45% of the respondents are joint family.

5. Monthly Income (in Rs.)

Table no.4.5 Monthly Income

Monthly Income	No. of Respondents	Percentage
Less than 20,000	18	18%
20,000 – 30,000	26	26%
30,000 – 40,000	37	37%
More than 40,000	19	19%

Chart no. 4.5. Monthly Income



Interpretation:

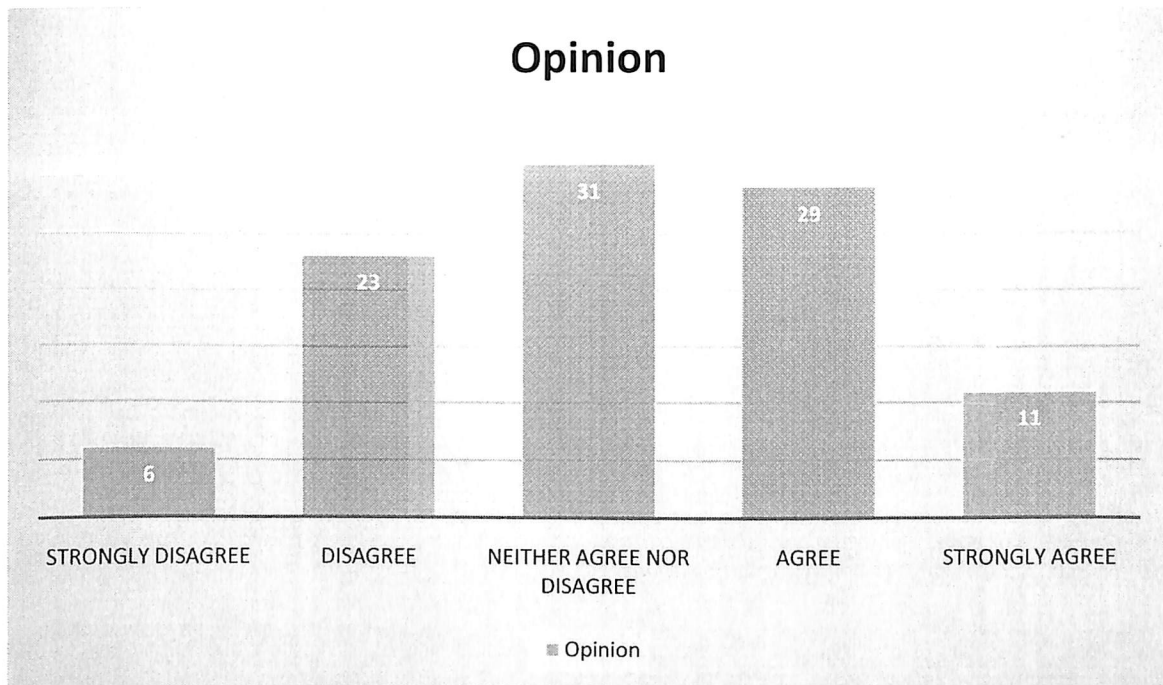
From the above table it is clear that 37% of the respondents have a monthly income of 30,000 to 40,000. 26% of the respondents have a monthly income of 20,000 to 30,000. 19% of the respondents have a monthly income of more than 40,000 and 18% of the respondents have a monthly income of less than 20,000.

6. Our organisation rely on few dependable suppliers.

Table no.4.6 Dependable Suppliers

Opinion	No. of Respondents	Percentage
Strongly disagree	6	6%
Disagree	23	23%
Neither agree nor disagree	31	31%
Agree	29	29%
Strongly agree	11	11%

Chart no. 4.6 Dependable Suppliers



Interpretation:

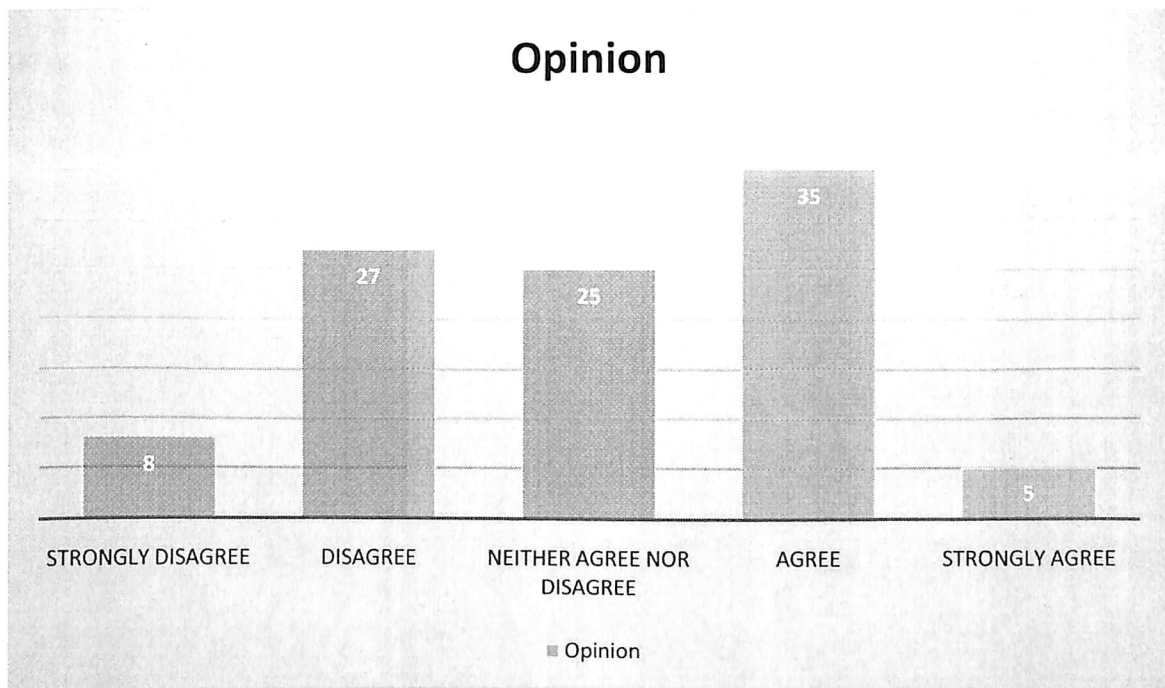
From the above table it is clear that 29% of the respondents agree and 11% strongly agree that the organisation rely on few dependable suppliers, 31% of the respondents were neutral whereas 23% of the respondents disagree and 6% strongly disagree.

7. Our Organisation Consider quality as number one criterion in selecting suppliers.

Table no.4.7 Selecting Suppliers

Opinion	No. of Respondents	Percentage
Strongly disagree	8	8%
Disagree	27	27%
Neither agree nor disagree	25	25%
Agree	35	35%
Strongly agree	5	5%

Chart no. 4.7 Selecting Suppliers



Interpretation:

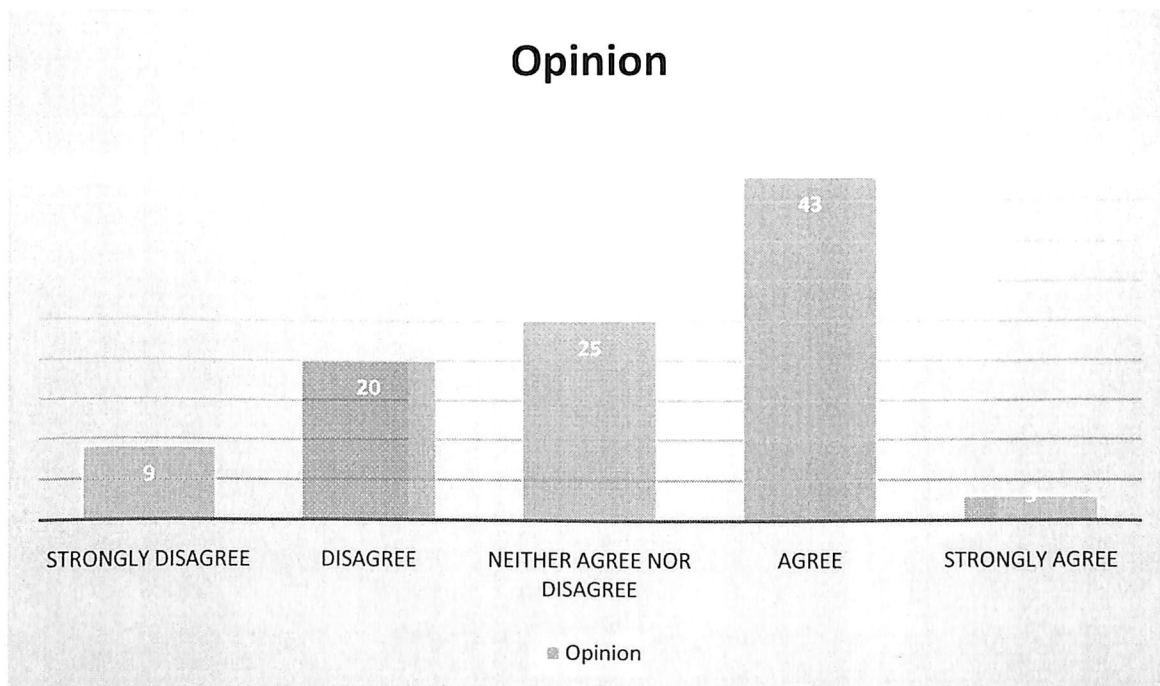
From the above table it is clear that 35% of the respondents agree and 5% strongly agree that the organization consider quality as number one criterion in selecting suppliers, 25% of the respondents were neutral whereas 27% of the respondents disagree and 8% strongly disagree.

8. Our organisation strive to establish long term relationship with its suppliers.

Table no. 4.8 Long Term Relationship

Opinion	No. of Respondents	Percentage
Strongly disagree	9	9%
Disagree	20	20%
Neither agree nor disagree	25	25%
Agree	43	43%
Strongly agree	3	3%

Chart no. 4.8 Long Term Relationship



Interpretation:

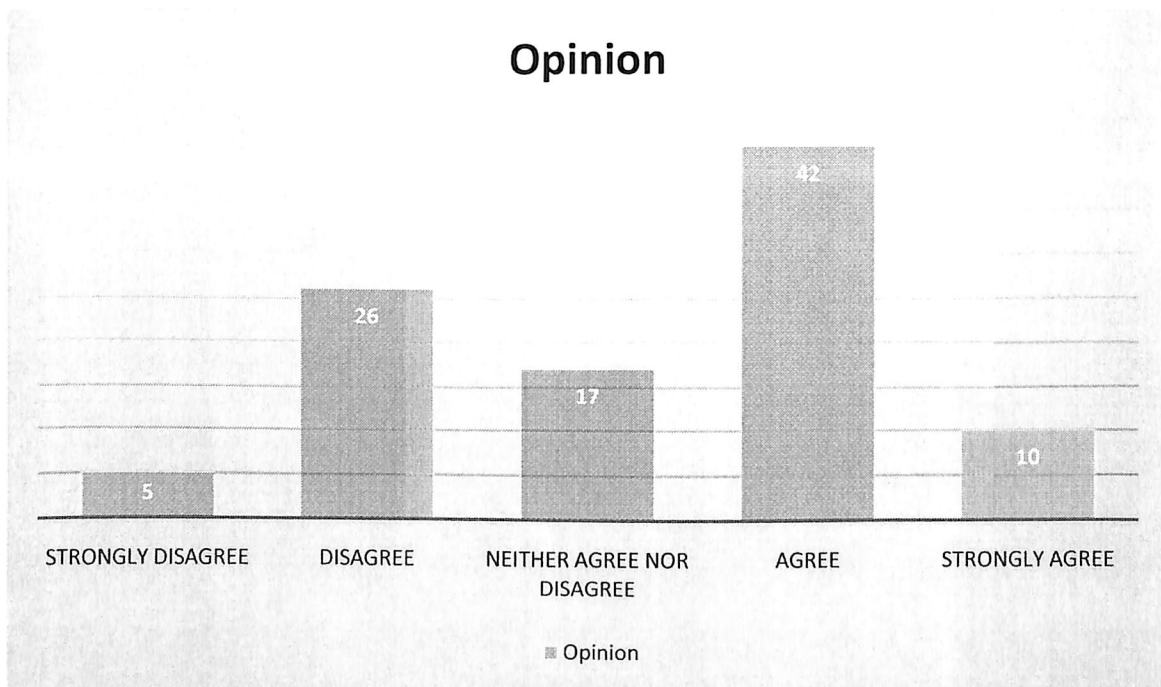
From the above table it is clear that 43% of the respondents agree and 3% strongly agree that the organisation strive to establish long term relationship with its suppliers, 25% of the respondents were neutral whereas 20% of the respondents disagree and 9% strongly disagree.

9. Our organisation helps its suppliers to improve their product quality.

Table no. 4.9 Product Quality

Opinion	No. of Respondents	Percentage
Strongly disagree	5	5%
Disagree	26	26%
Neither agree nor disagree	17	17%
Agree	42	42%
Strongly agree	10	10%

Chart no. 4.9 Product Quality



Interpretation:

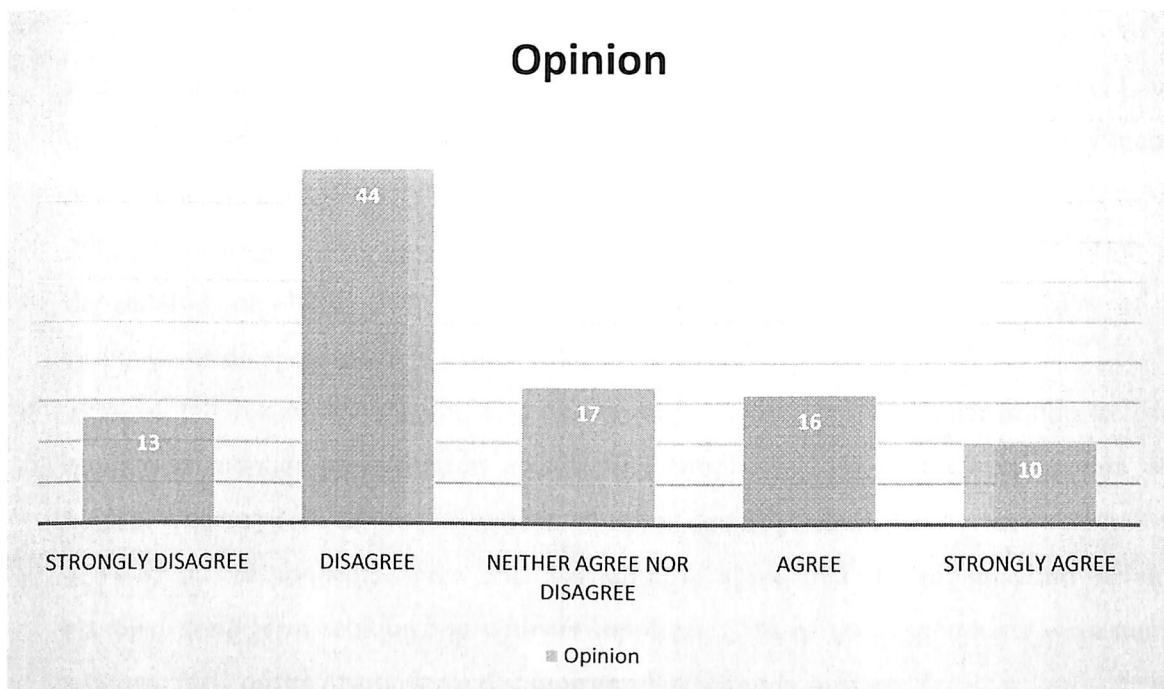
From the above table it is clear that 42% of the respondents agree and 10% strongly agree that the organisation helps its suppliers to improve their product quality, 17% of the respondents were neutral whereas 26% of the respondents disagree and 5% strongly disagree.

10. Your organisation include its key suppliers in its planning and goal setting activities.

Table no. 4.10 Goal Setting Activities

Opinion	No. of Respondents	Percentage
Strongly disagree	13	13%
Disagree	44	44%
Neither agree nor disagree	17	17%
Agree	16	16%
Strongly agree	10	10%

Chart no. 4.10 Goal Setting Activities



Interpretation:

From the above table it is clear that 16% of the respondents agree and 10% strongly agree that the organisation include its key suppliers in its planning and goal setting activities, 17% of the respondents were neutral whereas 44% of the respondents disagree and 13% strongly disagree.

CHAPTER 5

INTERPRETATION OF RESULTS

5.1 INTERPRETATION OF RESULTS

- ✓ 67% of the respondents are male and 33% are females.
- ✓ 36% of the respondents are of the age group of 36-45 years, 29% are 26-35 years' age group, 23% are 46 years and above and 12% of the respondents are of the age group of 18-25 years.
- ✓ 61% of the respondents are married and 39% of the respondents are unmarried.
- ✓ 55% of the respondents are from nuclear family, and 45% of the respondents are joint family.
- ✓ 37% of the respondents have a monthly income of 30,000 to 40,000. 26% of the respondents have a monthly income of 20,000 to 30,000. 19% of the respondents have a monthly income of more than 40,000 and 18% of the respondents have a monthly income of less than 20,000.
- ✓ 29% of the respondents agree and 11% strongly agree that the organisation rely on few dependable suppliers, 31% of the respondents were neutral whereas 23% of the respondents disagree and 6% strongly disagree.
- ✓ 35% of the respondents agree and 5% strongly agree that the organisation consider quality as number one criterion in selecting suppliers, 25% of the respondents were neutral whereas 27% of the respondents disagree and 8% strongly disagree.
- ✓ 43% of the respondents agree and 3% strongly agree that the organisation strive to establish long term relationship with its suppliers, 25% of the respondents were neutral whereas 20% of the respondents disagree and 9% strongly disagree.
- ✓ 42% of the respondents agree and 10% strongly agree that the organisation helps its suppliers to improve their product quality, 17% of the respondents were neutral whereas 26% of the respondents disagree and 5% strongly disagree.
- ✓ 16% of the respondents agree and 10% strongly agree that the organisation include its key suppliers in its planning and goal setting activities, 17% of the respondents were neutral whereas 44% of the respondents disagree and 13% strongly disagree.

CHAPTER 6

CONCLUSION AND SCOPE OF FUTURE WORK

Conclusion

More efficient and cost effective supply chain practices within the petroleum industry represent major factors for maintaining the supplies of petroleum , the reduction of lead times, and lowering of production and distribution costs. Due to the inflexibility involved within the petroleum industry's supply chain network, logistics represent an excellent challenge. However, it's just one of several challenging factors. Integrated process management, information systems and knowledge sharing, organizational restructuring, and cultural reorientation are equally important.

Despite the good challenges within the petroleum industry's supply chain, opportunities for improvements and price savings do exist along the availability chain. One major area for improvement and price savings lies within the logistics function. Companies within the petroleum industry became increasingly reliant on the services of third party logistics companies to function their logistics and supply chains. Companies within the petroleum industry took the major step to collaborate with competitors and located shared solutions to their supply chain challenges. This form of collaboration is mentioned as a scientific cooperative reciprocal barter, or swaps.

Collaboration among competing companies within the sort of swaps may be a practice which will offer companies huge savings and introduce new opportunities. However, despite its more use and benefits, especially within the oil and petrochemical industries, the topic has not received the eye it deserves within the operations management relations. Currently, judgmental methods and therefore the aid of spreadsheets are the sole approaches utilized when attempting swap decisions. Although great savings are realized by companies using swap practices, the approaches used for creating such decisions, cannot guarantee an optimal solution and the opportunities to utilize the whole capability of swap practices are not fully expressed. Therefore, subsequent step would be the use of management science techniques, presumably mathematical simulations models. These methods will significantly enhance the potential of such sorts of collaboration and can represent valuable tools for practitioners to use.

Scope of Future Work

The future will present further challenges, Indian Oil SkytankingPrivated Limited will be required to be flexible and responsive towards their supply chain and logistics management process and consistently introduce innovations so as to further improve operational efficiency, quality and price effectiveness. The study has been restricted to only Indian Oil Skytanking Private Limited and it is recommended that further study may be conducted on other players in the Indian Petroleum Industry to know the innovations in their respective supply chain and logistics management process and therefore the benefits which are derived.

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