RESEARCH PROJECT

ON

"Supply chain Management & Logistics Systems of Halonix Limited"

FOR THE PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF

BACHELOR OF BUSINESS ADMINISTRATION

UNDER THE GUIDANCE OF:
PROF. ASHOK KUMAR SHARMA

SUBMITTED BY
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BBA 6th Sem
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GALGOTIAS UNIVERSITY
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SCHOOL OF BUSINESS, GALGOTIAS UNIVERSITY

Certificate from Faculty Guide

This is to certify that the project report ***"Supply chain Management & Logistics Systems of Halonix Limited"***has been prepared by **Mr. Ankush Chaudhary,** under my supervision and guidance.The project report is submitted towards the partial fulfillment of full time Bachelor of Business Administration.

PROF. ASHOK KUMAR SHARMA

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Date:

Student Declaration

I, **ANKUSH CHAUDHARY**, bearing, as student of BBA Galgotias University, Gr. Noida, solemnly declare that the project report titled, **"SUPPLY CHAIN MANAGEMENT & LOGISTICS SYSTEMS OF HALONIX LIMITED"** embodies the results of original research work carried out by me and the same has not been submitted in any form partially or fully for award of any diploma or degree of this or any other University/Institute.

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ACKNOWLEDGEMENT

A successful completion of a research work is like a golden feather for any cap. Truly this cannot be turned without apt guidance and help. One must always be obliged to his guide and helpers.

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EXECUTIVE SUMMARY

As per my research work Halonix Ltd. is amongst India's fastest growing residential and institutional lighting company. Set up over 2 decades ago as a Indo-Japanese joint venture, Halonix has made the successful transition from being a largely private label business to a profitable branded business. The success of Halonix has been built on the back of its unparallelled ability to develop, test and deploy lighting solutions relevant and suitable for Indian conditions. Due to its keen focus on innovation and quality control, the brand is widely accepted all across India by consumers and trade alike. Halonix is a progressive, environment friendly lighting company. It is keenly focused on emerging technologies like LED and CFL's. It has amongst the widest range of products across LED, CFL, Luminaires , Home Decorative Lighting , Halogens and High Intensity Discharge Lamps. As a brand that stands for 'The right light', Halonix continues to push the boundaries to develop better solutions across the spectrum of home and commercial lighting. Technologically advanced, our sound infrastructure has served as the basis for our business expansion. With well equipped laboratory facilities for quality, calibration and research & development, we have been constantly increasing our production capacity each passing year. Further, the implementation of SAP ERP, has resulting in increased operational efficiency through optimum utilization of available resources. We have established long-term professional relationship with Private Labels across the globe. Quality without creativity is meaningless. As changes grow ever more unpredictable creativity is rapidly becoming recognized a core management skill.

As per my research work today's business environment demands that managers posses in a supply chain and logistics is a wide range of knowledge skills and competencies in Halonix, as well as sound understanding of management process and function. Managers need to be able to make best use of their time, talent and of other people to work with and through others to achieve corporate objectives. They also need to demonstrate their ability not merely to solve problems, but to transform them and design ways through them.

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CHAPTER 1
INTRODUCTION

Halonix Limited, promoted in the year 1991 as an Indo Japanese Joint Venture, is counted amongst the most preferred manufacturers and suppliers of Compact Fluorescent Lamps for General Lighting and Halogen Lamps for Automotive. The company saw change in ownership in the year 2007 and was taken over, by Actis, a major Private Equity player. After which, there has been a reorganization in the management structure that has resulted in increased business activity across the globe.

Supply Chain Management (SCM) is the management of the flow of goods and services. It includes the movement and storage of raw materials, work-in-process inventory, and finished goods from point of origin to point of consumption. Interconnected or interlinked networks, channels and node businesses are involved in the provision of products and services required by end customers in a supply chain. Supply chain management has been defined as the "design, planning, execution, control, and monitoring of supply chain activities with the objective of creating net value, building a competitive infrastructure, leveraging worldwide logistics, synchronizing supply with demand and measuring performance globally."

SCM draws heavily from the areas of operations management, logistics, procurement, and information technology, and strives for an integrated approach. Supply chain management is a cross-functional approach that includes managing the movement of raw materials into an organization, certain aspects of the internal processing of materials into finished goods, and the movement of finished goods out of the organization and toward the end consumer. As organizations strive to focus on core competencies and becoming more flexible, they reduce their ownership of raw materials sources and distribution channels. These functions are increasingly being outsourced to other firms that can perform the activities better or more cost effectively. The effect is to increase the number of organizations involved in satisfying customer demand, while reducing managerial control of daily logistics operations. Less control and more supply chain partners led to the creation of the concept of supply chain management. The purpose of supply chain

management is to improve trust and collaboration among supply chain partners, thus improving inventory visibility and the velocity of inventory movement. Organizations increasingly find that they must rely on effective supply chains, or networks, to compete in the global market and networked economy. In Peter Drucker's new management paradigms, this concept of business relationships extends beyond traditional enterprise boundaries and seeks to organize entire business processes throughout a value chain of multiple companies.

This inter-organisational supply network can be acknowledged as a new form of organisation. However, with the complicated interactions among the players, the network structure fits neither "market" nor "hierarchy" categories. It is not clear what kind of performance impacts different supply network structures could have on firms, and little is known about the coordination conditions and trade-offs that may exist among the players. From a systems perspective, a complex network structure can be decomposed into individual component firms. Traditionally, companies in a supply network concentrate on the inputs and outputs of the processes, with little concern for the internal management working of other individual players. Therefore, the choice of an internal management control structure is known to impact local firm performance.

In the 21st century, changes in the business environment have contributed to the development of supply chain networks. First, as an outcome of globalization and the proliferation of multinational companies, joint ventures, strategic alliances, and business partnerships, significant success factors were identified, complementing the earlier "just-in-time", lean manufacturing, and agile manufacturing practices. Second, technological changes, particularly the dramatic fall in communication costs (a significant component of transaction costs), have led to changes in coordination among the members of the supply chain network.

Halonix Limited engages in the manufacture and supply electrical lamps in India. It offers general lighting products, including compact fluorescent lamps, fluorescent lamps, high intensity discharge lamps, halogen lamps, and incandescent bulbs. The company

also offers solar based photo voltaic home and street lighting systems, and lighting equipment for use in emergency or in places where lighting does not penetrate; and halogen lamps for two and three wheelers, passenger cars, and commercial vehicles, as well as for off road applications. In addition, it offers luminaries for residential, retail, industrial, hospitality, and public lighting applications. The company was formerly known as Phoenix Lamps Limited and changed its name to Halonix Limited in January 2009. Halonix Limited was founded in 1991 and is based in Noida, India.

Halonix Limited, promoted in the year 1991 as an Indo Japanese Joint Venture, is counted amongst the most preferred manufacturers and suppliers of Compact Fluorescent Lamps for General Lighting and Halogen Lamps for Automotive. The company saw change in ownership in the year 2007 and was taken over, by Actis, a major Private Equity player. After which, there has been a reorganization in the management structure that has resulted in increased business activity across the globe. Innovation and new product development have always been our focus areas, we have set our eyes on providing state-of-art lighting solutions for commercial, public, retail and outdoor spaces and for providing the same we have entered into a partnership with NVC, Zonca and Grechi that are among the leading companies in the luminaires sector. With a investment of USD 70 million, we have set up five fully integrated state-of-the-art manufacturing plants located at Noida, Haridwar and Dehradun. Each plant is managed by skilled manpower. With a collective capacity of producing over 150 millions lamps annually, we have been able to successfully execute bulk orders and thus have captured a major portion of the domestic and international markets. Delivering our products effectively to the diverse markets with the help of our wide distribution network across India, we have created a long list of satisfied clients. With our consistent efforts, we have developed a strong foothold in the domestic market which has inspired us to spread our wings in the international arena.

We vision to emerge as the premier lighting player offering complete lighting solutions by the end of year 2010 through our commitment towards unswerving quality and high service standards at the most competitive prices. Halonix Limited (formerly known as

Phoenix Lamps Limited) are committed to offer reliable and qualitative products to our global clients. Active participation of the employees is encouraged by the management to bring in continuous innovations and improvisations in the product range and thereby achieve client delight. Wherein the wealth created is not just for the company but consistently for the shareholders as well. With unrelenting efforts and commitment towards maintaining high quality we have etched a position and developed a formidable reputation for ourselves in the industry. Some of our demonstrated strengths are as follows:

- We are considered as largest OEM manufacturer of **CF Lamps and Halogen Lamps**.
- Our accreditations like ISO 9001: 2000, ISO/TS 16949: 2002, ISO 14001: 2004 and OHSAS 18001: 2007 is a clear evidence of the superior quality of our products.
- We have five technologically advanced manufacturing units, which are well equipped with the facilities of quality inspection, calibration and research & development.
- Our product portfolio highlights an extensive range of more than 500 different types Halogen Lamps and CFL's.
- Our high quality products have gained us a wide network of contended clients across the globe.

1.2 TRUSTPASS PROFILE

TrustPass® serves to provide transparency regarding the identity and legitimacy of your trading partners on Alibaba.com. Only companies that have completed an Authentication and Verification procedure conducted by a third-party credit-reporting agency have a TrustPass Profile.

Halonix has acquired the undisputed status of being a Total Lighting Solution Provider. It has emerged as the largest manufacturer of Compact Fluorescent Lamps and Halogen Lamps, suitable for commercial as well as residential establishments. Capitalizing on technologically superior five state-of-the-art manufacturing plants, we are able to successfully cater to the growing needs of our products across the globe.

1.3 COMPANY PROFILE

Halonix Limited (formerly known as Phoenix Lamps Limited), promoted in the year 1991 as an Indo Japanese Joint Venture, is counted amongst the most preferred manufacturers and suppliers of Compact Fluorescent Lamps for General Lighting and Halogen Lamps for Automotive. The company saw change in ownership in the year 2007 and was taken over, by Actis, a major Private Equity player. After which, there has been a reorganization in the management structure that has resulted in increased business activity across the globe.

We have been accredited with ISO 9001: 2000, ISO/TS 16949: 2002, ISO 14001: 2004 and OHSAS 18001: 2007 certificates, which is a clear evidence of our superior performance and commitment towards achieving excellence. Due to our thorough technical acumen and vast industry experience, we are aggressively pursuing growth and aim to be the No. 1 Lighting player by the end of 2017-18.

Innovation and new product development have always been our focus areas, we have set our eyes on providing state-of-art lighting solutions for commercial, public, retail and outdoor spaces and for providing the same we have entered into a partnership with NVC, Zonca and Grechi that are among the leading companies in the luminaires

sector. With a investment of USD 70 million, we have set up five fully integrated state-of-the-art manufacturing plants located at Noida, Haridwar and Dehradun. Each plant is managed by skilled manpower. With a collective capacity of producing over 150 millions lamps annually, we have been able to successfully execute bulk orders and thus have captured a major portion of the domestic and international markets. Delivering our products effectively to the diverse markets with the help of our wide distribution network across India, we have created a long list of satisfied clients. With our consistent efforts, we have developed a strong foothold in the domestic market which has inspired us to spread our wings in the international arena.

1.4 PRODUCTS AND SERVICES PROVIDED BY HALONIX LTD.

Halonix, India's no. 1 CFL manufacturer delivers more than 200 different types of lamps for General Lighting catering to both domestic & international markets. Our products are in line with latest available technologies and are ISI & CE compliant. Also, Halonix products meet stringent requirements as per European & RoHS (Restriction of Hazardous Substances) standards. Our product range includes lamps, which can fit in all types of luminaires in both indoor & outdoor lighting.

1.5 HALONIX GENERAL LIGHTING PRODUCT RANGE

- **Compact Fluorescent Lamps**

  These are an energy saving source of light which saves upto 80% of energy and lasts 6 times more than incandescent lamp. Also, these are available in wide range of shapes & wattages ranging from 5W to 55W which are suitable for a wide range of lighting fixtures.

  - CFL Retrofit Lamps
  - CFL Non-Retrofit Lamps

- **Fluorescent Lamps**

  These lamps have a slim design and are available in 14W & 28W which are used for Indoor & Industrial Lighting.

  - T5 Lamps
  - T8 Lamps
  - T12 Lamps

- **High Intensity Discharge Lamps (HID)**

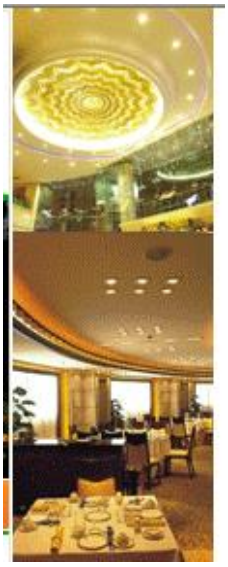
These lamps are suitable for outdoor & industrial applications and are available in wattages ranging from 70W to 400W.

  - Metal Halide Lamps(MH)
  - High Pressure Sodium Vapour Lamps (HPSV)

- **Halogen Lamps**
- They offer a perfect solution for floodlighting, spotlighting, showrooms & decorative lighting and are available in different colors.
  - Double Ended Linear Halogen Lamps (J-Series)
  - Low Voltage Halogen Lamps (MR-16)

- **Incandescent Bulbs**
- They are the most common solution for lighting across the world.


Lighting the world through technology...



MISSION

- Improved Customer Satisfaction at the Optimized Cost.
- Be a Preferred Supplier with Customers and Preferred Partners with Channel Partners in Logistics Solutions.
- Value, Velocity and Visibility.

PRINCIPLES

- Customer Focus by Improving Efficiency of Operations.
- Informed Decision making using IT as one of the Key Business Differentiators.
- Uncork Supply Chain Surplus.
- Network of Organizations working for common Purpose and Mutual Benefits.

FACTS AND FIGURES OF COMPANY

- India's first Private Container Operator.
- Completed 1.5 Successful Years of Operation.
- Developing Logistics parks at Key Areas in India.
- Providing Multi Modal end to end Logistics Service.
- Providing Solution to all Manufacturing and Break – Bulk Verticals.
- Planning for Express trains connecting Metros

1.10 SERVICE PROVIDED BY HALONIX LTD.

Halonix delivers seamless logistics services supported by Advanced Logistics Management and IT. We meet the complex logistical needs of a rapidly changing environment with our unique strategies for generating group synergy.

1.11 HALONIX CURRENTLY OFFERS THE FOLLOWING SERVICES:

- Container Cargo Service By Rail

  They also provide end-to-end Logistic Solutions to our customers in Containerized Cargo.
- Distribution Centers (Covers Warehouse Facility)

  We store the cargo & distribute to various destinations as per the instruction of the principal. The facility at Ghaziabad has been built up in area of 1,20,000 sq. feet.

1.12 HALONIX IS COMING UP WITH FOLLOWING SERVICES VERY SOON:

- CFS (Container Freight Station), Terminals and Logistics Parks.

MILESTONES

- Strategic Alliance with central warehousing corporation for EXIM Traffic Movement.
- Currently running 8 Trains.

VALUED CUSTOMERS

- Metal manufacturing units (aluminium/zinc/other), Ferrous based industries, Agriculture Industries , EXIM and Cement Industry.

COMPETITORS

Logistics sector has evolved from basic transportation to total supply chain of management. The end to end approach involves providing whole package of function including understanding the product requirement of packing, holding, warehousing, transportation, distribution and customer services etc.

With Increase in competition, more companies have started their outsourcing supply chain management to cut down cost and add values to there products.

The success of the Logistics industry depends on the promptness with which the products can be easily supplied to a particular destination or to a client. Time and location are two factors which can either make or mar the logistics industry. The logistics industry is governed by technology, integration, globalization, legislation and confederation. Formerly, warehousing facilities and logistic facilities were situated in remote areas like water port, beside rail tracks and those places in towns or cities which were not treaded up on by many. However, these sites shifted to rural areas and other localities. The logistics industry has experiences several changes over the years. These changes can be attributed to the growth in the retail industry and the manufacturing segments.

FEATURES OF INDIAN LOGISTICS INDUSTRY

- A number of small – integrated players
- Transportations costs accounts for nearly 40 percent of production costs.
- Logistics costs around 15 percent of GDP, compared to 8 percent in the U.S.
- Growth of Indian economy is the major driving factor for the demand in logistics industry.
- Chemicals, metals, FMCG, cement and textiles have been identified as the top five contributions to logistics revenue.

LOGISTICS IN INDIA THROUGH

- Road
- Rail
- Sea
- Aviation

ROAD

- India has second highest largest road networks of 3.3 millions km.
- U.S has the largest road network with 6.4 million km and china with 1.8 million km.
- National highways -2 percent of total road length.
- But carry 40 percent of goods traffic of India.

FEATURES OF INDIAN ROAD TRANSPORT

- Road network carry nearly 65 percent of freight and 85 percent of passengers traffic.
- Vehicle ownership is firmly in the hands of individual's track owners.
- 67 percent vehicle owners have fleets of less than five vehicles.
- Traffic on road is growing at rate of 7 to 10 percent per annum.
- Govt. spends 2 percent of capital and 3 percent of total expenditure on road.

RAIL

- The tone per km cost of Indian rail freight is three times that of china.

RAIL FREIGHT PRIVATIZATION

- Rail services have been liberalized.
- Pvt. Players- Reliance industries, P&O ports, APL logistics, Maersk, Central warehousing corporation, Halonix ltd, Adani logistics, and many more to come..

SEA

- India has 12 major and 184 minor or intermediate ports spread across the vast coastlines of 7517 km .
- The 12 major pots handle about 76% of the traffic.
- Indian west coast ports handles almost 70% of traffic.
- At present India has the largest merchant shipping fleet among the developing countries.
- India ranks 17th in the world of shipping tonnage.
- Indian share of maritime transport services is 1% of world market.

PRIVATE PORTS

- Ports traffic is expected to grow to a level of 650 millions tones per annum by 2008.
- Port privatization is picking up momentum.
- Major players are P&O, PSP, Moersk, gammon india and CWC.

AIR

- Aviation holds a small share of Indian freight market.
- Air freight is expensive in India as compared to road and rail.

- The size of world air cargo market is estimated to be 27 million tones valued at $200 billion.
- India accounts for meager is 3% of the global air cargo market.
- As per experts estimate, Indian air cargo industry is going to be doubled by the year 2010.

THIRD PARTY LOGISTICS

- 3rd Party Logistics imply that one company acts as an agent to look after the logistics aspect of another company or group of companies.
- 3rd Party Logistics entails a study of the customer's business supply chain and distribution network in order to formulate a comprehensive integrated logistics strategy, which will help render all supply related services from a single window.
- India's 3PL respect is 3 % of the countries total logistics spend.
- Indian 3PL market is expected to grow at around 20 % per annum in the coming 3 to 5 years.
- The Practice in India reveals that warehousing and outbound transportation, custom clearing and forwarding are the most frequent outsourced activities.
- Activities such as packaging, fleet management and consolidation have started gaining attention for outsourcing.

GROWTH DRIVERS FOR LOGISTICS IN INDIA

- General growth of the Indian economy.
- Manufacturing boom – for exports as well as for domestic market.
- Expected rise in International Trade from India.
- MNC's setting up manufacturing in India – Nokia, Flextronics.
- Government's thrust of Infrastructure – US $17 billon, to upgrade highway network.
- Implementation of VAT will lead to growth in warehousing business.
- Opening of organized retail sector – attracting retail chains like Wal-Mart and Carrefour in addition to Indian Players like Pantaloon and Reliance.

1.13 SUPPLY CHAIN MANAGEMENT IN HALONIX LIMITED

A supply chain is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers. Supply chains exist in both service and manufacturing organizations, although the complexity of the chain may vary greatly from industry to industry and firm to firm.

Below is an example of a very simple supply chain for a single product, where raw material is procured from vendors, transformed into finished goods in a single step, and then transported to distribution centers, and ultimately, customers. Realistic supply chains have multiple end products with shared components, facilities and capacities. The flow of materials is not always along an arborescent network, various modes of transportation may be considered, and the bill of materials for the end items may be both deep and large.

Traditionally, marketing, distribution, planning, manufacturing, and the purchasing organizations along the supply chain operated independently. These organizations have their own objectives and these are often conflicting. Marketing's objective of high customer service and maximum sales dollars conflict with manufacturing and distribution goals. Many manufacturing operations are designed to maximize throughput and lower costs with little consideration for the impact on inventory levels and distribution capabilities. Purchasing contracts are often negotiated with very little information beyond historical buying patterns. The result of these factors is that there is not a single, integrated plan for the organization---there were as many plans as businesses. Clearly, there is a need for a mechanism through which these different functions can be integrated together. Supply chain management is a strategy through which such an integration can be achieved.

Supply chain management is typically viewed to lie between fully vertically integrated firms, where the entire material flow is owned by a single firm, and those where each channel member operates independently. Therefore coordination between the various players in the chain is key in its effective management. Cooper and Ellram [1993] compare supply chain management to a well-balanced and well-practiced relay team. Such a team is more competitive when each player knows how to be positioned for the hand-off. The relationships are the strongest between players who directly pass the baton, but the entire team needs to make a coordinated effort to win the race.

SUPPLY CHAIN DECISIONS

We classify the decisions for supply chain management into two broad categories -- strategic and operational. As the term implies, strategic decisions are made typically over a longer time horizon. These are closely linked to the corporate strategy, and guide supply chain policies from a design perspective. On the other hand, operational decisions are short term, and focus on activities over a day-to-day basis. The effort in these type of decisions is to effectively and efficiently manage the product flow in the "strategically" planned supply chain.

There are four major decision areas in supply chain management: 1) location, 2) production, 3) inventory, and 4) transportation (distribution), and there are both strategic and operational elements in each of these decision areas.

LOCATION DECISIONS

The geographic placement of production facilities, stocking points, and sourcing points is the natural first step in creating a supply chain. The location of facilities involves a commitment of resources to a long-term plan. Once the size, number, and location of these are determined, so are the possible paths by which the product flows through to the final customer. These decisions are of great significance to a firm since they represent the basic strategy for accessing customer markets, and will have a considerable impact on revenue, cost, and level of service.

PRODUCTION DECISIONS

The strategic decisions include what products to produce, and which plants to produce them in, allocation of suppliers to plants, plants to DC's, and DC's to customer markets. As before, these decisions have a big impact on the revenues, costs and customer service levels of the firm. These decisions assume the existence of the facilities, but determine the exact path(s) through which a product flows to and from these facilities. Another critical issue is the capacity of the manufacturing facilities--and this largely depends the degree of vertical integration within the firm. Operational decisions focus on detailed production scheduling. These decisions include the construction of the master production schedules, scheduling production on machines, and equipment maintenance. Other considerations include workload balancing, and quality control measures at a production facility.

INVENTORY DECISIONS

These refer to means by which inventories are managed. Inventories exist at every stage of the supply chain as either raw materials, semi-finished or finished goods. They can also be in-process between locations. Their primary purpose to buffer against any uncertainty that might exist in the supply chain. Since holding of inventories can cost anywhere between 20 to 40 percent of their value, their efficient management is critical in supply chain operations. It is strategic in the sense that top management sets goals. However, most researchers have approached the management of inventory from an operational perspective. These include deployment strategies (push versus pull), control policies --- the determination of the optimal levels of order quantities and reorder points, and setting safety stock levels, at each stocking location. These levels are critical, since they are primary determinants of customer service levels.

TRANSPORTATION DECISIONS

The mode choice aspect of these decisions are the more strategic ones. These are closely linked to the inventory decisions, since the best choice of mode is often found by trading-off the cost of using the particular mode of transport with the indirect cost of inventory associated with that mode. While air shipments may be fast, reliable, and warrant lesser

safety stocks, they are expensive. Meanwhile shipping by sea or rail may be much cheaper, but they necessitate holding relatively large amounts of inventory to buffer against the inherent uncertainty associated with them. Therefore customer service levels, and geographic location play vital roles in such decisions. Since transportation is more than 30 percent of the logistics costs, operating efficiently makes good economic sense. Shipment sizes (consolidated bulk shipments versus Lot-for-Lot), routing and scheduling of equipment are key in effective management of the firm's transport strategy.

SUPPLY CHAIN MODELING APPROACHES

Clearly, each of the above two levels of decisions require a different perspective. The strategic decisions are, for the most part, global or "all encompassing" in that they try to integrate various aspects of the supply chain. Consequently, the models that describe these decisions are huge, and require a considerable amount of data. Often due to the enormity of data requirements, and the broad scope of decisions, these models provide approximate solutions to the decisions they describe.

To facilitate a concise review of the literature, and at the same time attempting to accommodate the above polarity in modeling, we divide the modeling approaches into three areas --- Network Design, ``Rough Cut'' methods, and simulation based methods. The network design methods, for the most part, provide normative models for the more strategic decisions. These models typically cover the four major decision areas described earlier, and focus more on the design aspect of the supply chain; the establishment of the network and the associated flows on them.

"Rough cut" methods, on the other hand, give guiding policies for the operational decisions. These models typically assume a "single site" (i.e., ignore the network) and add supply chain characteristics to it, such as explicitly considering the site's relation to the others in the network. Simulation methods is a method by which a comprehensive supply chain model can be analyzed, considering both strategic and operational elements.

However, as with all simulation models, one can only evaluate the effectiveness of a pre-specified policy rather than develop new ones. It is the traditional question of "What If?" versus "What's Best?".

NETWORK DESIGN METHODS

Finally, Arntzen, Brown, Harrison, and Trafton [1995] provide the most comprehensive deterministic model for supply chain management. The objective function minimizes a combination of cost and time elements. Examples of cost elements include purchasing, manufacturing, pipeline inventory, transportation costs between various sites, duties, and taxes. Time elements include manufacturing lead times and transit times. Unique to this model was the explicit consideration of duty and their recovery as the product flowed through different countries. Implementation of this model at the Digital Equipment Corporation has produced spectacular results --- savings in the order of $100 million dollars.

Clearly, these network-design based methods add value to the firm in that they lay down the manufacturing and distribution strategies far into the future. It is imperative that firms at one time or another make such integrated decisions, encompassing production, location, inventory, and transportation, and such models are therefore indispensable. Although the above review shows considerable potential for these models as strategic determinants in the future, they are not without their shortcomings.

Additionally, those that consider stochastic elements are very restrictive in nature. In sum, there does not seem to yet be a comprehensive model that is representative of the true nature of material flows in the supply chain.

ROUGH CUT METHODS

These models form the bulk of the supply chain literature, and typically deal with the more operational or tactical decisions. Most of the integrative research (from a supply chain context) in the literature seem to take on an inventory management perspective. In fact, the term "Supply Chain" first appears in the literature as an inventory management approach. The thrust of the rough cut models is the development of inventory control policies, considering several levels or echelons together. These models have come to be known as "multi-level" or "multi-echelon" inventory control models. For a review the reader is directed to Vollman et al. [1992].

First, these studies largely ignore the production side of the supply chain. Their starting point in most cases is a finished goods stockpile, and policies are given to manage these effectively. Since production is a natural part of the supply chain, there seems to be a need with models that include the production component in them.

Second, even on the distribution side, almost all published research assumes an arborescence structure, i. e. each site receives re-supply from only one higher level site but can distribute to several lower levels.

Third, researchers have largely focused on the inventory system only. In logistics-system theory, transportation and inventory are primary components of the order fulfillment

process in terms of cost and service levels. Therefore, companies must consider important interrelationships among transportation, inventory and customer service in determining their policies.

Fourth, most of the models under the "inventory theoretic" paradigm are very restrictive in nature, i.e., mostly they restrict themselves to certain well known forms of demand or lead time or both, often quite contrary to what is observed.

The preceding sections are a selective overview of the key concepts in the supply chain literature. Following is a list of recommended reading for a quick introduction to the area.

1.14 HALONIX SUPPLY CHAIN MODEL

HALONIX SUPPLY CHAIN

One of the main reasons for Halonix's success is its supply chain management, with which Halonix has established a major sustainable competitive advantage.

Halonix has over 40 distribution centers located at different geographical locations in the US. Over 80,000 items are stocked in these centers. Halonix's own warehouses directly supply 85 percent of the inventory, as compared to 50-65 percent for competitors. According to rough estimates, Halonix is able to provide replenishments within two days (on average), against at least five days for competitors.

Shipping costs for Halonix are roughly 3 percent versus 5 percent for their competitors.

Those numbers speak for themselves, and are the result of driving up efficiency to its maximum. Distribution centers are divided into different sections on the basis of the quantity of goods received. Goods meant for distribution within the US usually arrive in pallets, while imported goods arrive in re-usable boxes or cases. In some cases, suppliers deliver goods such as automotive and drug products directly to the stores.

Through continuous information sharing with its vendors and constant upgrading of the system, Halonix has been able to reduce its handling costs by eliminating unnecessary loading and unloading of goods.

A receptive supply chain has enabled Halonix to manage successful relationships with its trading partners and customers. Using technology as its main weapon, it offers low cost and prices while improving efficiency.

A Diagrammatical representation of the complete supply chain management at Halonix is shown below which acts as a starting point for us to start discussing the Halonix supply Chain.

1.15 VALUE CHAIN OF HALONIX

Internal Value Chain Analysis: Excellent use of value chain activities.

1INBOUND LOGISTICS. One of the most important reasons for Halonix success has been its inbound logistics. Halonix pioneered the development of a hub-and-spoke distribution system. Its central distribution warehouses are strategically located to serve clusters of Halonix stores which lead to minimized shipping times.

OPERATIONS. Hand-held scanners allow Halonix to monitor its inventory in real-time. This helps Halonix reduce the potential for stock outs and excess inventory. Other significant operations that differentiate Halonix from competitors are the use of people greeters and the ten foot rule.

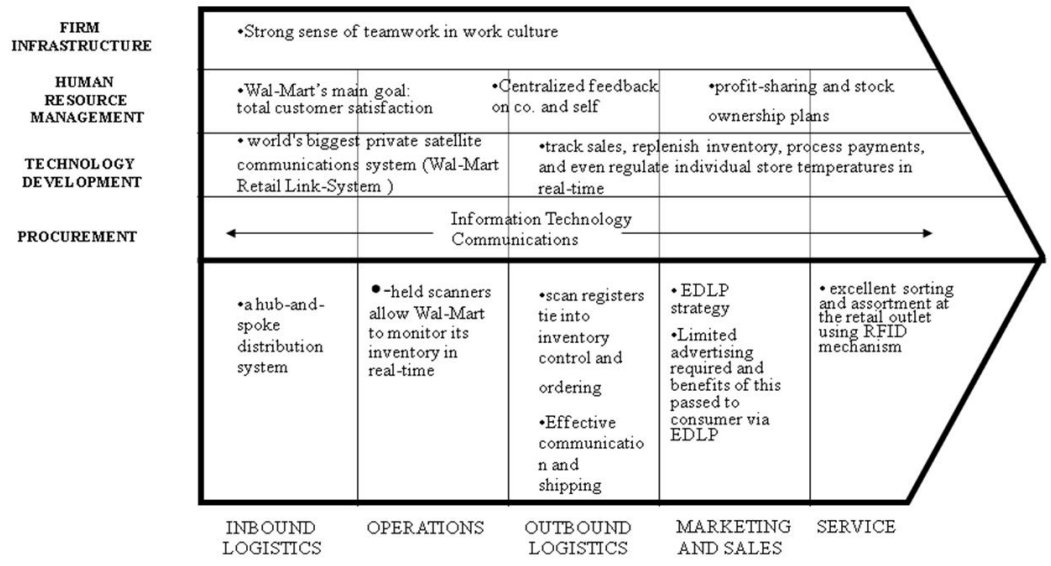
OUTBOUND LOGISTICS. Bar scan registers tie into inventory control and ordering which is another key factor for Halonix success in its excellent inventory control systems. Halonix has continuous contact with its distribution centers, suppliers, and every point of sale in each store, so that orders can be executed quickly. Halonix also has an extensive communications network that connects all stores, warehouses, and suppliers. Effective shipping processes provide quick delivery from distribution centers to stores and as a result its efficient plant operations allow Halonix to minimize its costs.

MARKETING AND SALES. Halonix every day low price (EDLP) strategy and limited promotional budgets proved unique in the industry. Not considered a "sale," Halonix ensures EDLP so consumers know they will find low-priced merchandise. Lower costs from other value chain activities help make possible the retailer's EDLP. This, in turn, helps the company save money because it rarely needs to advertise promotions.

HUMAN RESOURCE MANAGEMENT. Halonix has a strong vision – it wanted all managers and workers to have a hands-on approach to their jobs and to be totally committed to Halonix main goal: total customer satisfaction. To motivate employees, a strategic control system was implemented that gave

employees at all levels feedback about their performance as well as the company's performance. Its culture pushed decision-making authority down to store managers, department managers, and individual employees. This culture also is backed by profit-sharing and stock ownership plans for all employees, including associates. This led to higher employee productivity, less shrinkage, and lower costs than industry rivals.

TECHNOLOGY DEVELOPMENT. Halonix operates the world's biggest private satellite communications system, the Halonix Retail Link-System. It helps track sales, replenish inventory, process payments, and even regulate individual store temperatures in real-time. Also, it allows Halonix to rapidly replenish stock in its stores and keep the amount of unproductive space to a minimum. The results are higher sales per square foot and more rapid inventory turnover. This combination helps increase store sales and drive down inventory and logistics costs. Another advantage Halonix has over competitors is its sophisticated information systems.



1.16 INBOUND LOGISTICS

PROCUREMENT POLICY

Global sourcing at Halonix is not the same as global procurement—Halonix has its own definition. There, global sourcing does not mean buying things. Instead, managers in Halonix's global sourcing unit focus on categories of goods or items where there is an opportunity to improve quality, lower price, or gain efficiencies on a worldwide or regional basis.

First, they identify basic products that people use all over the world, and then they look for opportunities to improve supply. Next, they work with producers to improve quality or lower price. Afterwards, the improved product is made available to all managers around the world. It is the managers who make the purchase decision.

An example of successful global sourcing is Halonix's success with copy paper. It first worked with a supplier to improve value to the customer through better-quality paper. As a result, sales of copy paper increased by 46 percent in the U.K., 94 percent in Germany, 38 percent in Canada, and 25 percent in the United States. In the end, Halonix wound up with only one supplier of copy paper, but that isn't always the case. When global sourcing managers investigated sources of bananas, they reduced the number of suppliers to three, not just one.

Global sourcing does not always mean lost sales for some suppliers. Sometimes it can mean almost instant global sales. Take the case of Oxyclean, a household cleaner. Originally sold only in the United States, it was later offered to stores elsewhere. By the end of the year, it was being sold in virtually every country where Halonix operates. This is why suppliers are so keen to work with Halonix. They might have to shave their costs, but the return in global sales can be enormous. What's more, Halonix picks up the distribution tab.

Recently, Halonix created an "in-country global sourcing champion" program. Designated in-country sourcing champions locate new items and promote them to Halonix. Once that happens, Halonix brings merchants from around the world to a

summit meeting where they can learn about new products. The company gets the managers' buy-in and feedback so that, once they leave, they become champions of new products. In addition to ensuring that merchants are on board with new products, the summits also foster communication and the study of best practices.

Halonix has high expectation on its suppliers. No early or late shipment is acceptable. Halonix does not do a business with business partner that does not meet its requirement. For e.g. Levi's had to invest a large amount of money to improve the supply chain system according to Halonix requirement.

CROSS-DOCKING AT HALONIX

In the cross-docking system, goods are continuously delivered to Halonix's warehouses, where they are selected, repacked, and then dispatched to stores, often without ever sitting in inventory. Instead of spending valuable time in the warehouse, goods just cross from one loading dock to another in 48 hours or less.

Cross-docking enables Halonix to achieve the economies that come with purchasing full truckloads of goods while avoiding the usual inventory and handling costs. Halonix runs a full 85% of its goods through its warehouse system -- as opposed to only 50% for Kmart. This reduces Halonix's costs of sales by 2% to 3% compared with the industry average. That cost difference makes possible the everyday low prices.

But that's not all. Low prices in turn mean that Halonix can save even more by eliminating the expense of frequent promotions. Stable prices also make sales more predictable, thus reducing stock outs and excess inventory. Finally, everyday low prices bring in the customer, which translates into higher sales per retail square foot. These advantages in basic economics make the greeters and the profit sharing easy to afford.

With such obvious benefits, why don't all retailers use cross-docking? The reason: it is extremely difficult to manage. To make cross-docking work, Halonix has had to make strategic investments in a variety of interlocking support systems far beyond what could be justified by conventional ROI criteria.

For example, cross-docking requires continuous contact among Halonix's distribution centers, suppliers, and every point of sale in every store to ensure that orders can flow in and be consolidated and executed within a matter of hours. So Halonix operates a private satellite-communication system that daily sends point-of-sale data directly to Halonix's 4,000 vendors.

HALONIX TRANSPORTATION SYSTEM

Another key component of Halonix's logistics infrastructure is the company's fast and responsive transportation system. The company's 19 distribution centers are serviced by nearly 2,000 company-owned trucks. This dedicated truck fleet permits Halonix to ship goods from warehouse to store in less than 48 hours and to replenish its store shelves twice a week on average.

By contrast, the industry norm is once every two weeks. To gain the full benefits of cross-docking, Halonix has also had to make fundamental changes in its approach to managerial control. Traditionally in the retail industry, decisions about merchandising, pricing, and promotions have been highly centralized and made at the corporate level. Cross-docking, however, turns this command-and-control logic on its head. Instead of the retailer pushing products into the system, customers "pull" products when and where they need them. This approach places a premium on frequent, informal cooperation among stores, distribution centers, and suppliers -- with far less centralized control.

1.17 OPERATION MANAGEMENT IN HALONIX LTD.

1INVENTORY MANAGEMENT

Halonix, pioneer in the inventory management, since 1990s, has reduced its overall cost structure, enhanced supply chain efficiency and increasing customer service. In order to continuous improve its receiving and shelving operations; Halonix expects detailed incoming inventory and delivery information. This information is also shared with the vendors.

TECHNOLOGICAL ADVANCEMENTS

- In collaboration with P&G, systems have been developed to manage the inventory in stores and automated re-ordering systems have been built. Signals are sent to P&G for items low in stock and, via satellite, a re-supply order is sent to the nearest P&G factory. The products are delivered either to the Halonix distribution center or straight to the needed store. This helps Halonix to constantly maintain its stock levels and to keep track of stock movement
- Halonix stores have ‘smart shelves' which read the chips and track the location. They alert the staff about ordering level as soon as shelves run low on stock and orders are placed by the system when stockrooms run low
- Using sophisticated algorithm systems, Halonix is able to forecast the exact quantities of items to be delivered. Through a centralized inventory data system, level of inventories and product location can be found out by personnel at the stores along with the tracking exact transition status. Immediate update is carried out.
- Employees have Hand-held computers, linked, via radio frequency network, to the in store terminals enabling them to keep track of the inventory, deliveries and to re-order. The Point of Sales (POS) system helps in the replenishment of goods, keeping track of the stock levels on the shelves

INVENTORY OPTIMIZATION METHODS USED AT HALONIX

Inventory flow: Computerized inventory systems gave managers real-time information on their stocks, speeding up the re-ordering of goods. These are considered to be the best practices and those days it was revolutionary.

Managing inventory in the supply chain is critical to ensure high customer service levels. However, it is also a very costly asset to maintain. Having the right amount of inventory to meet customer requirements is critical. Let us discuss what inventory best practices reduce inventory costs across the supply chain.

Here are 4 main solutions that Halonix uses to keep on top of inventory:

ELIMINATE DEAD STOCK:

Dead stock refers to the materials that have been lying for a long period of time. Let us for a clothing line to be sold in a store, typically all of the unsold seasonal merchandise to a clearance store, marking down prices by as much as 70%. If it did not sell there, it was shipped to an off-site warehouse (because the main warehouse would usually be full) where it was checked, labeled and inventoried into the system. Massive amounts of paper reports would be generated and kept in logs. Thereby they have a markdown policy that clears merchandise in the store – no need to transport it and inventory it for many years. It makes sure that you have a pro-active policy that clears dead stock.

PERFORMING - AN ABC ANALYSIS OF THE INVENTORY:

Pareto's Law, otherwise known as the 80/20 rule applies to Inventory Management. For example, 80% of your sales are represented by 20% of your items. Let's look at a hypothetical situation for a full-service food warehouse with 40,000 SKUs.

Halonix realized that about only 5,000 items represent 75.7% of the annual sales volume. These SKUs are classified as 'A' items. They may include items such as milk, produce, bread and snack foods. To ensure a high level of customer service, it is imperative that these items have a high in-stock level. From a management perspective, it's sensible to keep low inventory of 'A' items and arrange for frequent replenishments, reducing capital requirements.

Conversely, the strategy best suited for ‘C’ items is to holding inventories and looking at other alternatives such as stockless buying .As ‘B’ items fall in between, they should be reviewed less often than ‘A’ items, however if they are ‘key’ items that consumers want, must be treated like ‘A’ items. For example, a young mother will want to purchase diapers for her new-born along with milk & bread, but if diapers are a ‘B’ item it must be treated as an ‘A’ item to ensure high customer satisfaction. This allows them to prioritize the inventory and manage it well.

ARRANGE STOCKLESS BUYING / SYSTEMS CONTRACTING

This is how it works: The Halonix would share its monthly production schedule with the supplier. The supplier is then responsible for ensuring that an adequate supply of materials is available at the manufacturer’s facility. There is a special secured area in which the supplier keeps the inventory. When a requisition request is generated in the manufacturer’s system, it allocates inventory to production. At this point an invoice is generated and the manufacturer pays for the materials it used. This introduces beneficial process efficiencies into the management of purchasing and inventory functions for both the manufacturer and the supplier. Halonix has been actively able to engage its suppliers and their second level supplier’s (supplier’s supplier) to be a part of this arrangement.

VENDOR MANAGED INVENTORY SYSTEMS (VMI)

Halonix is a leader in the field of vendor managed inventory -- asking large suppliers to oversee stock control for a category and make recommendations to Halonix buyers. This reduces the overhead of having a large inventory control and buying department. Halonix's vast purchasing power also gives it the leverage to force manufacturers to change their production (usually by creating cheaper products) to suit its wishes: a single Halonix order can easily comprise a double-digit percentage of a supplier's annual output.

Vendor managed inventory (VMI) systems have placed the responsibility for the replenishment function to the vendors. For example, Heinz, a manufacturer of ketchup, will arrange to have its products available to Halonix. They will monitor

sales and send the right quantities at the right time to ensure Halonix consumers will find Heinz ketchup on store shelves. The purchasing/order processing functions are more streamlined, allowing the management team of Heinz's customers to focus their efforts on other areas.

VMI has evolved to Collaborative Planning, Forecasting and Replenishment (CPFR), which included additional partners in the supply chain. Halonix, a world leader in CPFR, has its own proprietary system called Retail Link, which gives all of its supplier's information on product sales history, inventories, in-stock percent, etc. across all of its retail locations over the last two years. Suppliers are responsible to maintain an in-stock level of 98.5%. The relationship works both ways. Halonix provides this information for free to help its suppliers; however their suppliers must meet the 98.5% in-stock level if they would like to remain a Halonix supplier.

Using the above four solutions Halonix has been able to reduce inventory costs in your supply chain. One of the few remaining ways to drive down inventory costs are a result of organizations becoming more collaborative and sharing their data across the supply chain.

1.18 ADVANTAGES OF VMI FOR THE CUSTOMER

- The stock as such disappears from the company's balance and this way clears the way for a higher amount of working capital.
- Customers only have to supervise the stocks, instead of drawing up a detailed analysis for the placing of orders. This way, there will be more time for more value-adding purchasing activities.
- In many cases, also the placing of the goods delivered by the supplier, at the warehouses as provided by the customer, will be executed or monitored by the supplier as such. This will drastically reduce the time interval between receiving the goods and making them available for consumption or sales.
- The principle of minimum order quantity (MOQ) disappears, because supplies are much more frequent (daily deliveries are not an exception). This means that delivery periods will shorten.
- Stocks with the customer will be reduced, because the uncertainty due to variability in the supplier's periods of delivery will drop. In fact, the supplier will assume a higher (more direct) responsibility with respect to delivering in time and keeping up the stock level.
- Often, the implementation of VMI, after a certain period, will enhance the service level and reduce the number of stock shortages that is because of the supplier having a better insight into his customer's business. Enhanced customer satisfaction in most cases gives cause to an increase of the sales figure of the customer, and therefore also of the supplier.

1.19 ADVANTAGES OF VMI FOR THE SUPPLIER

Apart from the fact that the implementation of VMI may produce a competitive advantage, even towards customers who do not agree with the VMI concept (research shows that a better planning from the supplier will result in a better service, including towards the non-VMI customers), also for the supplier there are a whole series of other advantages :

- As the supplier gets access to the consumption with the customer, the "forecastability" of the data may increase, so that better forecasts will be made about the future consumption. This gives cause to more accurate stock levels and finally to a reduction of the general emergency stocks with the supplier.
- There is a clear purchasing commitment from the customer to the supplier, representing a high sales figure and often covering a wide range of products. The relation between supplier and customer is also strengthened because of the setting up of electronic links. The implementation of such systems often involves investments that are not to be neglected, so that the threshold for the customer to change supplier is increased.
- In times of acute market shortages of specific items, the supplier has the possibility to move stocks from one customer to another (of course always in mutual consultation with the customer).
- The number of "rush-orders" and the thereto related higher costs, is reduced.

1.20 VENDOR SELECTION

Halonix selects its vendors by first and foremost assessing whether thy have adequate financing capacities. This is taken has a surrogate to see whether the venders have what it takes to handle Halonix's massive production and Halonix size returns long before negotiations begin. After this elimination criterion, Halonix urges the potential vendors to go to a Halonix Super Center and figure out where their product should be placed. If they find a spot they think they should overtake then they are required to be ready to justify why their product is better and can be sold cheaper. They also suggest these potential candidates to get to know their competitors and who they are. This is done because a buyer would have to be convinced to stock a new product that has not been heard of before as it carries an opportunity cost. This opportunity cost is dilution of share of a proven and known value with an unproven and unknown value.

Another consideration is the amount of open-to-buy the buyer has for his department. In other words, how many dollars does he have left in his budget to spend on product, whether new or old. Seasonal returns, advertising and sales promotions, departmental landed gross, interest on inventory purchased, and markdowns both current and year-to-date all play a factor in determining the amount of available open-to-buy the buyer has to spend.

HALONIX LOCAL VENDOR PROGRAMME:

This program is one of the easiest ways to become a vendor. Your products usually need to be unique and locally referenced in some way. This program is the best way for small local business to set up shop with Halonix which allows smaller orders to be distributed in your local area. Starting at a slow pace can let you get a feel of how Halonix operates.

COLLABORATIVE PLANNING, FORECASTING AND REPLENISHMENT (CPFR)

Collaborative Planning, Forecasting, and Replenishment (CPFR) is a concept that aims to enhance supply chain integration by supporting and assisting joint practices. CPFR seeks cooperative management of inventory through joint visibility and replenishment of products throughout the supply chain. Information shared between suppliers and retailers aids in planning and satisfying customer demands through a supportive system of shared information. This allows for continuous updating of inventory and upcoming requirements, making the end-to-end supply chain process more efficient. Efficiency is created through the decrease expenditures for merchandising, inventory, logistics, and transportation across all trading partners.

Halonix, a world leader in CPFR, has its own proprietary system called Retail Link, which gives all of its supplier's information on product sales history, inventories, in-stock percent, etc. across all of its retail locations over the last two years.

Halonix's Retail Link system enables almost all of its suppliers to monitor their product sales and refill goods. Millions of daily transactions are processed through this system and next day are transferred to every Halonix store.

The largest and most sophisticated computer system, Massively Parallel Processor (MPP) is owned by Halonix which tracks the movement of goods and stock levels. An extensive contingency plan exists in case of a major breakdown.

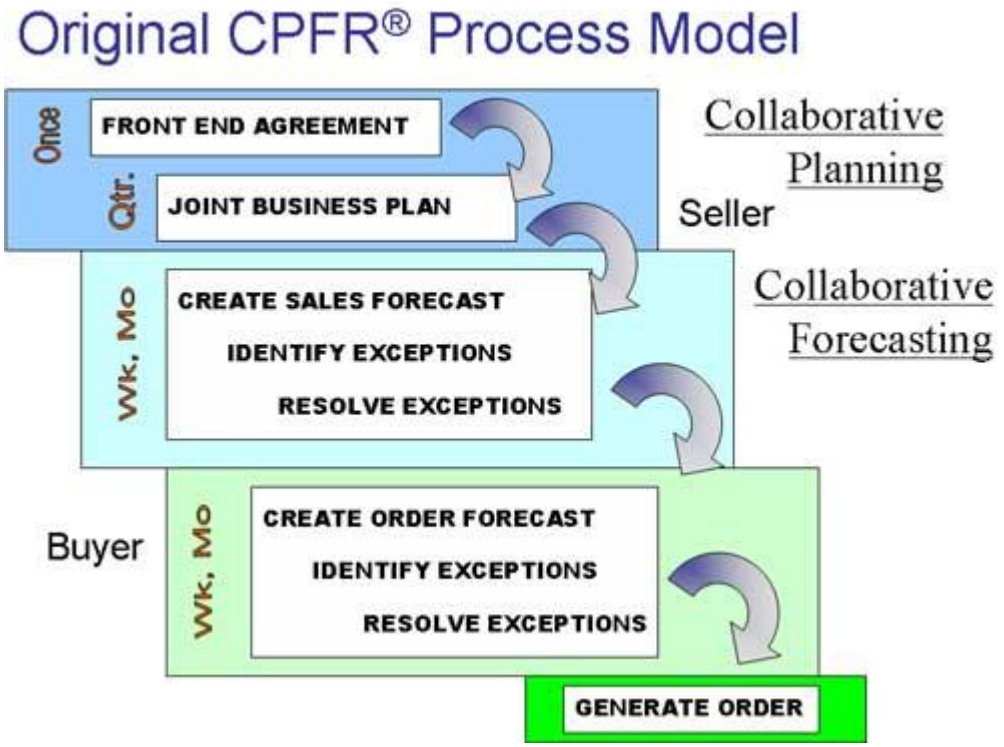
It is an industry-wide initiative, is used to control the inventory costs and level, enabling accurate orders placement. Through CPFR, Halonix and its vendors jointly:

a) Create a sales forecast,

b) Identify possible exceptions,

c) Resolve these exceptions.

CPFR consists of 9 process steps, which are depicted in the diagram depicted below.



HALONIX RETAIL LINK SYSTEM

Halonix, a world leader in CPFR, has its own proprietary system called Retail Link, which gives all of its supplier's information on product sales history, inventories, in-stock percent, etc. across all of its retail locations over the last two years.

Halonix's Retail Link system enables almost all of its suppliers to monitor their product sales and refill goods. Millions of daily transactions are processed through this system and next day are transferred to every Halonix store.

Halonix uses Retail Link to provide vendors with the information needed to forecast demand for their products. This is critical for vendors to forecast which products to stock at what time and how many.

For example, if you are a Marketing Specialist with Henkel and your product is the Roll-on Insulator Kit, your job is to forecast how many kits you will need to produce and when to ship them to keep each Halonix store in your territory stocked all the time. To accurately forecast, you would use Retail Link to view the historical sales of your product. You would then place the order to your production department to send your kits to each specific store in your region.

Without the information provided from Retail Link, Halonix vendors would not be able to accurately forecast and have the right products in the right store at the right time.

More than 10,000 Halonix suppliers use Retail Link to monitor sales of their goods at the store level and replenish inventories as needed. This integrates into one of the largest data warehouses around, with more than 100 terabytes of information and makes daily transactions details (more than 10 million daily) available to every Halonix store by 4 a.m. the next day.

- Provides communication between Halonix and suppliers.
- Manages purchase orders and invoices.
- Provides suppliers with sales and inventory data at every store.

VENDOR INVOLVEMENT

- Halonix success depends on vendors' analysis.
- Halonix expects vendors to lower prices over time.
- Vendors often need to make technology and business process changes to use Retail Link effectively.
- Largest vendors have employees stationed at Halonix corporate headquarters.

RETAIL LINK SYSTEM

- More than 10,000 Halonix suppliers use Retail Link to monitor sales of their goods at the store level and replenish inventories as needed.
- Integrates into one of the largest data warehouses around, with more than 100 terabytes of information.
- Make daily transactions details (more than 10 million daily) available to every Halonix store by 4 a.m. the next day.

Through Retail Link, suppliers/vendors can retrieve:

- Purchase Orders
- Sales performance data
    - Determine how many of their products were sold at Halonix the previous day
    - Examine the effects of markdowns or returns on their inventory
    - Access reports on sales over a period of up to two years, as well as sales forecasts for their products for up to one year
- Inventory levels
- Invoice status
- Halonix has high expectation on its suppliers.
- No early or late shipment is acceptable.
- Halonix does not do a business with business partner that does not meet its requirement.
- Levi's had to invest a large amount of money to improve the supply chain system according to Halonix requirement.

RADIO FREQUENCY IDENTIFICATION (RFID)

Strong supply chain management has been the backbone of Halonix success and now it has one step further by implementing radio-frequency ID (RFID) tags, in year 2005. Its main interest to deploy RFID is to achieve further low price for its customers. RFID technology - which facilitates Electronic product codes (EPC) - has been in use since the 1940s. Anyone using a toll tag or unlocking a car door using a keyless remote is already using RFID. In the supply chain application, passive RFID chips with small antennae are attached to cases and pallets.

RFID or Radio Frequency Identification can be used for access control, tacking, monitoring, or management. The RFID tag is a small microchip with an antenna which looks like a tiny ribbon. It can be used as a label or imbedded in cardboard. The chip stores information about the product and this information can be used once it is read by an RFID reader. This process reduces costs of inventory management and

makes the inventory process much more efficient. Halonix required its top 100 suppliers to put RFID tags on shipping crates by January 1st 2005.

The retailing major is intending to use the data to keep track when stock is running low on shelves or when items have been stolen.

The other advantages expected are:

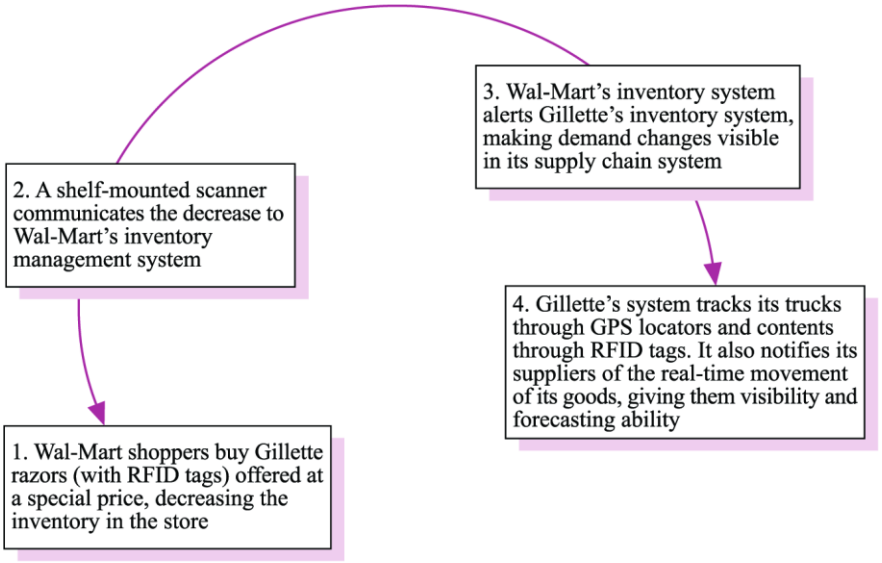
- The movement of inventory can be tracked
- Goods can be received and shipped faster
- Ease of predicting product demand
- Shoppers can save time
- Out of stock situations can be avoided
- Shoppers get a better deal as system becomes more efficient
- The right products are available at the right stores at the right time
- Boost sales

With all these advantages in sight, Halonix is the industry leader and the best in efficient utilization of such technological advancements.

WORKING OF RFID AT HALONIX

Gillette was one of the first eight companies to participate in the initial RFID pilot with Halonix. Today, they use RFID technology to track their inventory as it moves through the supply chain, from the manufacturer to the distribution center, to the retailer stock room, to the shelf on the sales floor of the store.

A diagrammatical explanation of RFID being used for Gillette at Halonix is explained step wise below.



Source: Adapted from Shankar and O'Driscoll (2003, p. 50)

1.21 OUTBOUND LOGISTICS

Halonix became one of the first and the best retailing companies in the world to centralize its distribution systems, pioneering the retail hub and spoke system.

HUB AND SPOKE SYSTEM

Under the system, goods were centrally ordered, assembled at a specially-built massive warehouse, known as the distribution centre (hub), from where they were dispatched to the individual stores (spokes) as per the orders received by the stores. Two key developments made the success possible: Distribution and Inventory flow are the two key developments made the success for Halonix in achieving proper business model.

Distribution: Highly automated distribution centers, cutting down on delivery time and costs.

Halonix became one of the first and the best retailing companies in the world to centralize its distribution systems, pioneering the retail hub and spoke system.

Under the system, goods were centrally ordered, assembled at a specially-built massive warehouse, known as the distribution centre (hub), from where they were dispatched to the individual stores (spokes) as per the orders received by the stores.

The hub and spoke system benefited Halonix in a lot of ways. Some of them are:

- Centralized purchase of goods in huge quantities
- Distribution of them through its own fast and responsive logistics infrastructure to its retail stores
- Bypassing all intermediaries, they managed to get the goods at the lowest prices.
- The company was able to replenish its stores twice a week.

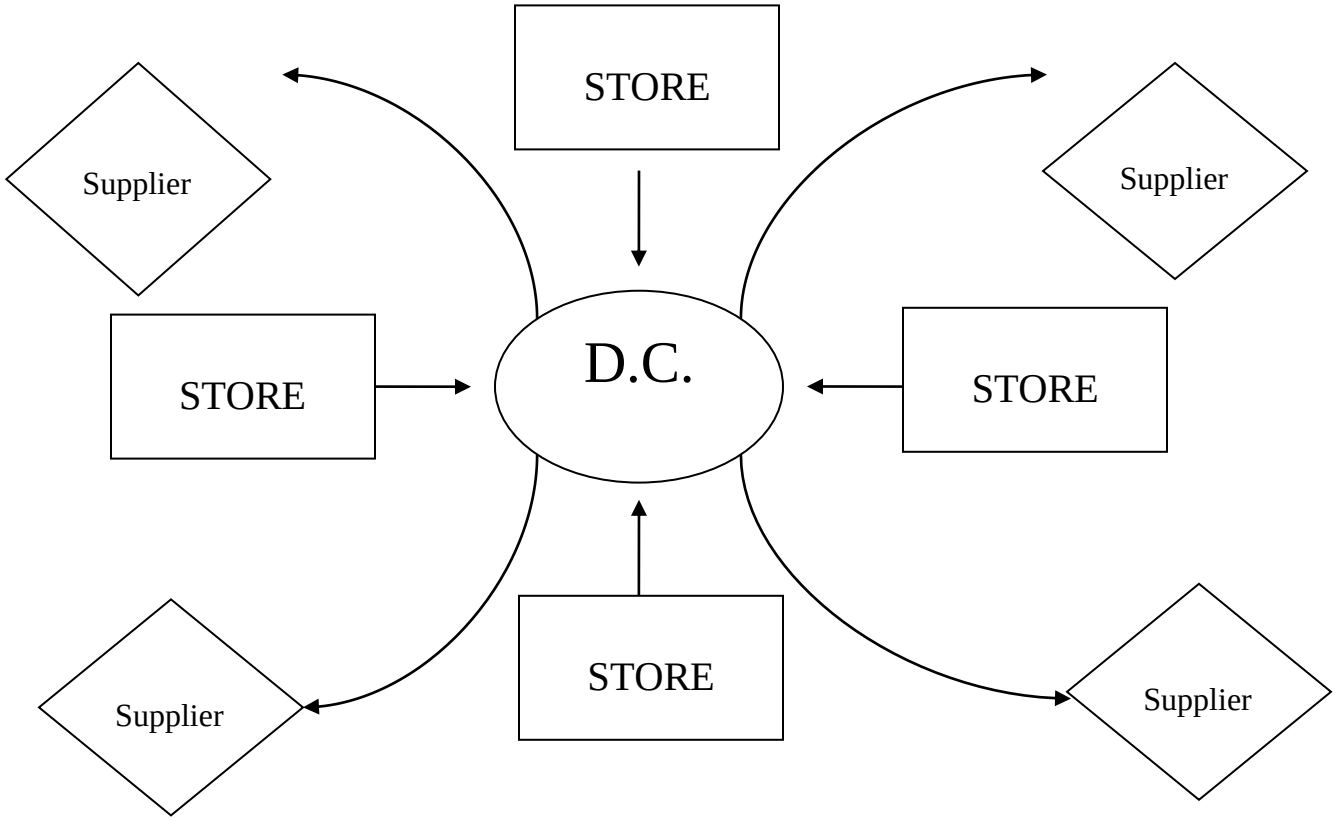


Fig: The hub and spoke system at Halonix

HALONIX VEHICLE MANAGEMENT SYSTEM

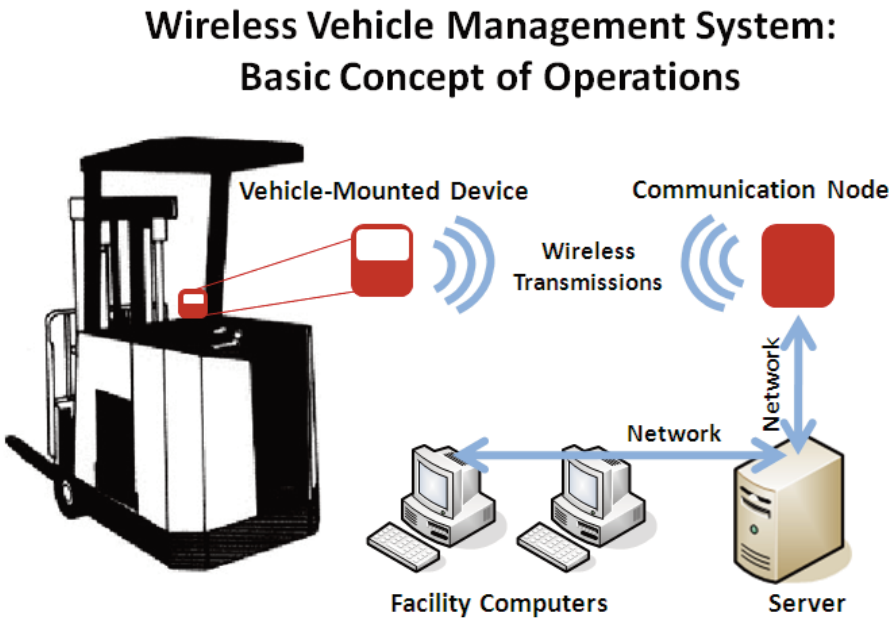
Being an innovator to the use of wireless technology—warehouse management systems (WMS) and radio frequency (RF) data communication systems, Halonix was considering wireless technology for another application: controlling and monitoring forklifts and other industrial vehicles that move merchandise inside its distribution centers. More than 100 such vehicles are utilized in a typical Halonix distribution facility.

NEED FOR INDUSTRIAL VEHICLE MANAGEMENT?

1. Forklifts and other industrial vehicles are the workhorses of material handling within distribution centers. They are critical factors in facility productivity and throughput. Halonix wanted to analyze how industrial vehicle management systems could influence productivity beyond what it was already accomplishing with its WMS and RF systems.

2. Halonix wanted to find out how an industrial vehicle management system could make its distribution facilities safer for its associates.

3. Industrial vehicles are expensive to acquire and maintain—significantly more expensive than the average passenger car—Halonix wanted to understand how an industrial vehicle management system might reduce the capital and operating costs associated with its fleet.



VEHICLE MANAGEMENT SYSTEM (VMS) HAS GIVEN HALONIX

(1) New ways to drive continuous improvement in material handling operations for increased productivity and throughput and

(2) New process controls for safety management.

AS A PRODUCTIVITY SYSTEM, THE VMS PROVIDES

- Unique data on peak vehicle utilization that enables optimal fleet "right-sizing".
- Unique metrics on operator activities that identify opportunities for productivity improvement and help optimize labor allocation across periods of varying activity levels.
- Software that displays a graphical facility map, which enables not only near real-me visibility of vehicle/operator location and status, but also the ability to play back a "breadcrumb trail" of vehicle movement over any slice of me.
- A two-way text messaging system that enables management to divert material handling resources effectively to the point of activity where they are needed the most.

FOR SAFETY MANAGEMENT, THE VEHICLE MANAGEMENT SERVICE PROVIDES

- Electronic vehicle access control with an independent, on-board database of driver training authorizations, which establishes and maintains operator accountability whether or not the vehicle has a live communication link to the rest of the system.

- An electronic safety checklist system with a patented, hierarchical, question-and-answer architecture, which can be configured independently for any number of different vehicle types, and which lets management choose a variety of both on-vehicle and system wide responses to vehicle problems.

- Impact sensing that provides a broad choice of automated management responses, from alerting a supervisor with visual or audible alarms, to

1.22 LOGISTICS SYSTEMS USED IN HALONIX LTD.

If we go by Bollywood definition, LOGISTICSs is the service which formulates - Subhe ka nashta Jaisalmer Mein, Dopahar ka khana Jaipur Mein aur Raat ki Daawat Delhi Mein – a reality. Syntax of logistics service is now not just confined to usual inbound/outbound transportation and Customs clearing and Forwarding; it has also been extended to more non-traditional services to services Such as reverse logistics, inventory management, packaging, labeling and even Order processing. logistics is the management of the flow of goods, information And other resources, including energy and people, between the point of origin and the point of consumption in order to meet the requirements of consumers (Frequently, and originally, military organizations). logistics involves the Integration of information, transportation, inventory, warehousing, material-Handling, and packaging, and occasionally security. logistics is a channel of the supply chain which adds the value of time and place utility.

The term "LOGISTICS" originates from the ancient Greek "λόγος" ("logos"—"ratio, word, calculation, reason, speech, oration") logistics is considered to have originated in the military's need to supply themselves with arms, ammunition and rations as they moved from their base to a forward position. In ancient Greek, Roman and Byzantine empires, there were military officers with the title 'Logistikas' who were responsible for financial and supply distribution matters**.**

The Oxford English dictionary defines logistics as:

"The branch of military science having to do with procuring, maintaining and transporting material, personnel and facilities." Another dictionary definition is: "The time related positioning of resources." As such, logistics is commonly seen as a branch of engineering which creates "people systems" rather than "Machine systems." India has an impressive network of transport system comprising of rail, road, ship, inland waterway, air etc. The network has expanded rapidly since independence (1947). The growth, though impressive, was not able to keep pace with

India's rapidly growing domestic and international Trade, leading to bottlenecks in infrastructure sector. As a result, growth of India's foreign trade suffered to some extent, particularly in the 1990s. Govt. of India, is playing a stellar role and making great efforts to improve the trade by:

- Privatizing ports,
- increasing the number of gateway ports,
- investing in highway projects,
- Streamlining customs, excise procedures,
- Implementing EDI system of data transfer, and
- improving the rail network by commencing services to new locations.

These initiatives made a positive impact on Indian **logistics** industry, which is Poised for a significant growth in the coming years as various companies across The sectors, especially in the textile, automotive, pharmaceutical, manufacturing And FMCG sectors are increasingly opting to outsource their **logistics** Requirements to specialized service providers. The future of logistics is in the Hands of 3PL (Third Party logistics) Realizing the potential in the outsourced logistics market, 3PL service providers are expanding their basket of services. Third party logistics service providers in India are gearing up to meet the growing Demand, incorporating value-addition in their services and customizing their Supply chain management solutions.

Why third party logistics?

Reducing overall costs: The logistics companies have a distribution network in Place and so can operate at a lower cost logistics providers can bring into the Relationship 'cross functional' industry experience that their clients does not have State-of-the-art logistics networks are characterized by linked databases, paperless Transactions, analytic modeling and real-time tracking and tracing capabilities, all Of which lead to faster time to market, lower inventories. So, that company can concentrate on their core competencies. So outsourcing logistics is a better option, as it allows companies to stick to their core-competencies Value-added services: Companies have come to

realize that good logistics can enhance the attractiveness of their products to the customers. As a result they seek providers whose operation can add value rather than simply keep the costs down. This leads to what is known as ‘Total transportation service offering’ one common theme that has emerged in the recent past is 'zero defect' and 'continuous improvement'. Some providers of logistics services, in effect, provide an extension to the product line, performing such activities as re-labeling, repacking or even final product configuration at their Distribution centers.

3PL in various sectors:

One sector that is increasingly looking for outsourcing logistics is Textile Especially as it is facing the challenges of demanding delivery requirements and multiple export markets. With large retailers such as Wal-Mart and Target Seriously evaluating new suppliers in India, this sector is bound to outsource logistics going forward. The retail industry is expected to jump into the 3PL Bandwagon, with large retailers such as Shoppers Stop, RPG, and Big Bazaar Expanding to smaller cities. Realizing the potential in the outsourced logistics Market, 3PL service providers are expanding the basket of services relevant to Retailing. Global logistics companies are not neglecting India’s fast emergence in the biotechnology sector. Leading international logistics firms (TNT Express, DHL, FedEx and UPS) are now offering medical and clinical sample transportation services to India. Logistics companies have begun transporting human eyes, hearts, Corneas, tissues, biopsy specimens, and samples of blood, serum, urine and stools. Although these involve huge risks, it is fast growing into a multi billion-dollar Business for them and the companies are eyeing for a major revenue generation from these activities. Present trends indicate that the cement sector has reaped the maximum benefits by outsourcing logistics requirements to 3PL service providers, especially as logistics constitute between 10 and 15 percent of their operating costs.

Likewise for the automobile and engineering sectors, logistics account for 5 to 10 per cent of their operations costs, while that for FMCG ranges between 3 and 7 per cent, as it gets the benefit of volumes.

What's happening in the Indian logistics sector?

Investment inflow to India's logistics sector is resulting in a step change in the structure of many domestic companies as they increasingly accept their critical role in the growth and development of the country. Key examples of this structural change include:

1) Traditionally known for serving the US$30bn Reliance Industries group, Reliance logistics has acquired more than 500 new Customers to service their logistics needs. The company's logistics expertise now Spans all modes of transport and service including Warehousing and all logistics-related infrastructure.

2) **All Cargo's acquisition of Eculine**. All Cargo was previously a traditional Transportation/materials handling company providing services at Mumbai Ports.

3) **Gati.** An exclusive tie-up with Europe based GLS has taken the domestic Indian express distribution and warehousing company into the realm of International logistics.

4) **Container Corporation of India (Concur).** This public sector Monopolist of the rail transport sector has entered the air cargo business. These Examples are just the tip of the iceberg. Many of India's lesser-known LSPs are getting deeper into their clients' business models to understand their expanding Needs and realign their own businesses to match. Take, for example, BLR India, a Company traditionally known as a road transporter today commands a hefty Presence in the EXIM logistics space. A key determinant of the nature of the ongoing change in the domestic sector is how companies are reinventing Relationships with clients in order to meet changing needs in a rapidly changing wider economy. My recent discussions with several Indian and

international LSPs have been enlightening. The following page has a summary of plans going forward.

SIGNIFICANT DEVELOPMENTS

Apart from regular 3PLs ramping up their operations, there is also a silent entry of larger logistics service users into provision of mainstream logistics services. Take For example the Rs5, 367crore (US$1.3bn) Jindal Steel's plans to invest up to Rs 500 crore into a new subsidiary called Jindal Utility and Infrastructure Ltd. The logistics foray will start with owning trucks to transport bulk materials such as ore, Steel and iron, similar to what Tata Steel does in its JV with German company Mar trade. The Tata Steel-Mar trade JV handles all the bulk logistics for Tata Steel. Other major industrial groups are getting into logistics too. M&M, the auto major, has Mahindra logistics, while Reliance Industries has Reliance logistics. Such arrangements are becoming common for companies.

Domestic air cargo traffic has been growing at CAGR of 12.80% from 2014-15 to 2015-16, whereas international air cargo traffic has been moving at CAGR of 13% during the same period. According to the Planning Commission, India's air cargo movements would grow at over CAGR of 11.5% from 2016-17 to 2017-18.

MARKET SHARE AND SIZE

In the recent down turn, Delhi based company "Halonix Limited" is on that place of success where it has earned 30% sales growth in 2017-2018. The turn over of this company at present in 2016 is 700 cr and Company has set up their branches on different – different important location in India and the future plan to extend its project in Faridabad, Chennai, Ahmadabad, Halol, Pune, NOIDA, Goa and Patna after the completion of Bhiwandi project.

Halonix plans to extend its business in SAARC region. The Halonix limited presents multi modal service on multi places on the desired time of customers. Because of it has spanned its leg from Kashmir to Kanayakumari and also has joint venture with Tredia Japan based company to handle the indo-Japanese consignment.

HALONIX'S KEY ENABLERS

- World Wide Real-time Connectivity with suppliers and Company
- SCM Proficiency
- Lowering Its Excess Expenditure
- Single Window Data Access
- Reliable Supplier Support
- Real time Supplier Contact
- Transaction Time Optimization
- First Mover Advantage in implementing State of the art Technologies
- Process Automation Efficiency
- Highest Inventory Management and Tracking
- On spot information on all the departments from Transaction,
- Inventory Balance and Process.

HALONIX'S KEY INHIBITORS

- Technology not fully tested so entering into troubled waters
- Real time Interface problems may occur due to RF Frequency Modulation
- Difficulty in Migration of the technology and adaptability
- Suppliers may be offended due to the pressure in migrating to new technology and process
- Process Redundancy Factors
- Huge Investment into new hardware and software**.**

CHAPTER -2

LITERATURE REVIEW

- According to Baldwin (2016) that the value-added is less for the tasks along the supply chain that are usually offshored. The obvious explanation relates to cost accounting. When a stage's cost is reduced by offshoring, its share in value-added falls, since a stage's value-added is based on cost. This basic cost-accounting effect can be amplified by two factors: technology transfer and relative market power.
- According to Kimura (2015), for instance, shows that international production networks in East Asia have positively worked for fostering local firms, at least in some sectors. In a study on Indonesia, Amiti and Konings (2014) find a positive impact of intermediate goods trade on a firm's productivity.
- According to Henderson et al. (2012) define global production networks as "the globally organized nexus of interconnected functions and operations by firms and non-firm institutions through which goods and services are produced and distributed". The concept has many predecessors, ranging from value chains, supply chains, global commodity chains, clusters, and actor-network theory.
- According to Prof. Ghosh K.M. (2012) and Ghosh et al. (2013) identify some differences in the filière concept, in that the time and international dimensions are lacking, being focused on static domestic scenarios, with its emphasis on the role of large firms and state institutions.
- According to Prof. Sethi J.M. et al. (2011) merges preceding definitions of a supply chain to produce the following: "a supply chain is defined as a set of three or more entities (organisations or individuals) directly involved in the upstream and downstream flows of products, services, finances, and/or information from a source to a customer." For the purposes of this chapter, this is also the definition we adopt moving forward.

According to Kapoor S.M. (2010), the number of tiers describes the horizontal structure of the supply chain, which may be long or short. The vertical structure of the supply chain refers to the number of organisations within each tier. These allow some orientation of the organisation within the supply chain, such as in describing the horizontal position of the focal firm relative to the ultimate supplier or customer.

According to Mary J. Meixell, Vidyaranya B. Gargeya (2011) in their paper "Global supply chain design: A literature review and critique" they review decision support models for the design of global supply chains, and assess the fit between the research literature in this area and the practical issues of global supply chain design. The classification scheme for this review is based on ongoing and emerging issues in global supply chain management and includes review dimensions for

(1) Decisions addressed in the model,
(2) Performance metrics,
(3) The degree to which the model supports integrated decision processes, and
(4) Globalization considerations

They conclude that although most models resolve a difficult feature associated with globalization, few models address the practical global supply chain design problem in its entirety. They close the paper with recommendations for future research in global supply chain modeling that is both forward-looking and practically oriented.

According to Chopra and Meindl (2014), a supply chain design problem comprises the decisions regarding the number and location of production facilities, the amount of capacity at each facility, the assignment of each market region to one or more locations, and supplier selection for sub-assemblies, components and materials says.

According to MacCarthy and Atthirawong (2013) Experts maintain that global supply chains are more difficult to manage than domesticsupply chains.

According to Rohde, 2010 and Bowersox (et al., 2012) Substantial geographical distances in these global situations not only increase transportation costs, but complicate decisions because of inventory cost tradeoffs due to increased lead-time in the supply chain. Firms

that implement Advanced Planning Systems (APS) may integrate production decisions across the supply chain by including supplier inventory and capacity constraints into their scheduling function, striving to avert supply problems before they occur. These integration practices also affect global supply chain design.

According to Dornier (et al., 2011) Brush (et al. 2012), several authors discuss the value and need for integration between facilities in the global supply chain. An integrated, well-coordinated global supply chain is difficult to duplicate and so plays an important role in competitive strategy. In current study lot of research has been done to understand what the Supply Chain Management is and how it is affecting organizations, what are different challenges and it can be proved as a tool for improving overall performance in today's global competition environment.

SCM has been interpreted by various researchers. Based on the relatively recent development of the supply chain literature, it is not surprising that there has been much debate as to a specific SCM definition. Ganeshan and Harrison (2012) has defined SCM as a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers. Lee & Corey stated that SCM consists of the integration activities taking place among a network of facilities that procure raw material, transform them into intermediate goods and then final products, & deliver products to customers through a distribution system. Christopher defined the supply chain as the network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer.

According to Mentzer (et al.2011) SCM is the "strategic and systematic coordination of the traditional business functions and the tactics across these business functions within a particular firm and across businesses within a supply chain, for the purposes of improving the long-term performance of the individual Companies and the supply chain as a whole".

The term logistics originated in the military which was concerned with the movement of personnel and materials during times of emergency. It was later adopted by businesses

and became a part of commonly used terminology in professional societies and academic programs. According to the Council of Supply Chain Management Professionals (CSCMP), logistics management is that "part of supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services and related information between 1 the point of origin and the point of consumption in order to meet customers' requirements". In summary, companies depend on their logistics systems to move materials, goods, equipment and people among supply chain partners. Logistics covers a wide range of business functions (Bozarth and Handfield) including:

• Transportation, • Warehousing, • Material handling, • Packaging, • Inventory management, and • Logistics information systems. CSCMP further adds that logistics management activities typically include • fleet management, • order fulfillment, • logistics network design, • supply/demand planning, • sourcing and procurement, • production planning and scheduling, and • customer service.

According to Weigel and Cao applied GIS in conjunction with Operations Research (OR) techniques to solve technician dispatching and home delivery problems at Sears, Roebuck and Company. Sears used a vehicle routing and scheduling system based on a geographic information system to run its delivery and home service fleets more efficiently. Although the problems to be solved can be modeled as vehicle routing problems with time windows (VRPTW), the size of the problems and thus practical complexity make these problems of both theoretical and practical interest. The authors constructed a series of algorithms, including an algorithm to build the origin and destination matrix, an algorithm to assign resources, and finally algorithms to perform sequencing and route improvement.

The combination of GIS and OR techniques improved the Sears technician dispatching and home delivery business. It (i) reduced driving times by 6%, (ii) increased the number of service orders each technician completed per day by 3%, (iii) reduced overtime by 15%, (iv) helped to consolidate routing offices from 46 to 22, and (v) achieved annual savings of $9 million. The success of this application also suggested a promising link

between GIS and OR techniques. It also helped ESRI, the GIS consultant for the project develop ArcLogistics, a low-cost PC-based routing-and-scheduling application that brings high-end functionality to small organizations who were previously unable to afford this technology.

Campbell, Labelle, and Langevin presents a new distance approximation approach that is useful in commercial transportation contexts. The motivation for the authors was to develop a simple and accurate distance approximation for use in an interactive GIS-based decision support system (DSS) for urban snow disposal. The hybrid approximation reduces data requirements and improves travel speed by eliminating local road details, but it maintains accuracy and incorporates obstacles by including the major roadways in a reduced network. The authors report results of an application in Montreal, Canada using a particular local distance approximation function, but the approach could easily be used with shortest paths or a more complex distance function for local travel.

Utilizing an improved travel distance model, the snow disposal DSS provides strategic and tactical benefits. Because travel cost is approximately proportional to travel distance, and travel cost comprises a major component of total snow disposal costs, having a more accurate distance model leads to system designs with lower costs.

The savings result from better utilization of existing equipment and from a reduction in the amount of equipment required. The ability to respond in real-time to contingencies with the DSS also allows for better tactical decision-making. Finally, the availability of an interactive tool for snow disposal design allows for a more structured and timely evaluation of different levels of service or changes in operating conditions.

We classify the decisions for supply chain management into two broad categories -- strategic and operational. As the term implies, strategic decisions are made typically over a longer time horizon. These are closely linked to the corporate strategy, and guide supply chain policies from a design perspective. On the other hand, operational decisions are short term, and focus on activities over a day-to-day basis. The effort in these type of decisions is to effectively and efficiently manage the product flow in the "strategically" planned supply chain.

There are four major decision areas in supply chain management:

1) Location, 2) production, 3) inventory, and 4) transportation (distribution), and there are both strategic and operational elements in each of these decision areas.

The strategic decisions include what products to produce, and which plants to produce them in, allocation of suppliers to plants, plants to DC's, and DC's to customer markets. As before, these decisions have a big impact on the revenues, costs and customer service levels of the firm. These decisions assume the existence of the facilities, but determine the exact path(s) through which a product flows to and from these facilities. Another critical issue is the capacity of the manufacturing facilities--and this largely depends the degree of vertical integration within the firm. Operational decisions focus on detailed production scheduling. These decisions include the construction of the master production schedules, scheduling production on machines, and equipment maintenance. Other considerations include workload balancing, and quality control measures at a production facility.

These refer to means by which inventories are managed. Inventories exist at every stage of the supply chain as either raw materials, semi-finished or finished goods. They can also be in-process between locations. Their primary purpose to buffer against any uncertainty that might exist in the supply chain. Since holding of inventories can cost anywhere between 20 to 40 percent of their value, their efficient management is critical in supply chain operations. It is strategic in the sense that top management sets goals. However, most researchers have approached the management of inventory from an operational perspective.

First, these studies largely ignore the production side of the supply chain. Their starting point in most cases is a finished goods stockpile, and policies are given to manage these effectively. Since production is a natural part of the supply chain, there seems to be a need with models that include the production component in them.

Second, even on the distribution side, almost all published research assumes an arborescence structure, i. e. each site receives re-supply from only one higher level site but can distribute to several lower levels.

Third, researchers have largely focused on the inventory system only. In logistics-system theory, transportation and inventory are primary components of the order fulfillment process in terms of cost and service levels. Therefore, companies must consider important interrelationships among transportation, inventory and customer service in determining their policies.

Fourth, most of the models under the "inventory theoretic" paradigm are very restrictive in nature, i.e., mostly they restrict themselves to certain well known forms of demand or lead time or both, often quite contrary to what is observed.

The preceding sections are a selective overview of the key concepts in the supply chain literature. Following is a list of recommended reading for a quick introduction to the area.

Global sourcing at Halonix is not the same as global procurement—Halonix has its own definition. There, global sourcing does not mean buying things. Instead, managers in

Halonix's global sourcing unit focus on categories of goods or items where there is an opportunity to improve quality, lower price, or gain efficiencies on a worldwide or regional basis. First, they identify basic products that people use all over the world, and then they look for opportunities to improve supply. Next, they work with producers to improve quality or lower price. Afterwards, the improved product is made available to all managers around the world. It is the managers who make the purchase decision.

OUTBOUND LOGISTICS

Halonix became one of the first and the best retailing companies in the world to centralize its distribution systems, pioneering the retail hub and spoke system.

HUB AND SPOKE SYSTEM

Under the system, goods were centrally ordered, assembled at a specially-built massive warehouse, known as the distribution centre (hub), from where they were dispatched to the individual stores (spokes) as per the orders received by the stores. Two key developments made the success possible: Distribution and Inventory flow are the two key developments made the success for Halonix in achieving proper business model.

Distribution: Highly automated distribution centers, cutting down on delivery time and costs.

PROBLEMS OF THE STUDY

- The major problems are identified as a biggest threat to Halonix is the possibility of technological changes. Halonix extensively uses technology. Although Halonix has the funds to partake in technological advances, the time and training that is spent improving the technology is a threat to the company. Advances in technology can dramatically alter an industry's landscape, opening up whole new frontiers, and making it possible to produce new and better products at lower costs. On the other hand, technology can also produce significant changes in capital requirements, minimum efficient plant sizes, distribution channels and distribution logistics, and learning or experience curve effect.
- When considering international expansion, in some countries the biggest challenge is that there is no organized supply chain
- Over reliance on Point of sale data capture can lead to the problem of bull whip effect which needs to take care of in a timely manner.
- Developing the responsible base for sourcing, which is compliant to global standards in terms of the kind of labor which is used, the manufacturing practices, and the quality of the product, is critical.
- Labor norms in some countries pose as a problem. Unionization exists in some countries which are opposed by Halonix leading to labor problems thus affecting the supply chain. Halonix encounters several conflicts with labor unions. They try to hire part-time workers to reduce hire costs. On average, workers at Halonix earn $3 dollars per hour less than workers in other major supermarkets, and $1 dollar per hour less than the average retail wage.
- Another threat to Halonix is the bargaining power of suppliers. It can create competitive pressures on Halonix. Although they are a large retain chain and typically have considerable negotiating leverage in purchasing products from manufacturers, Halonix still faces the possibility of suppliers escalating their degree of bargaining power.

CHAPTER-3

OBJECTIVES OF THE STUDY

- To analyze the supply chain and logistics system in Halonix Limited.
- To analyze the nature and functions of different logistics industry.
- To study about identifying the problems faced by the Halonix Ltd. in the area of SCM and logistics.
- To study about supply chain management systems used in Halonix Limited.
- To study and find out what Halonix can provide for the further betterment of the company in the filed of logistics as a complete logistics solution providers

CHAPTER-4

RESEARCH METHODOLOGY

DATA COLLECTIONS METHODS

PRIMARY DATA

Primary Data is that which is collected a fresh and for the first time and thus happens to be original in characters.

- Primary Data used in this study is collected through telephonic survey.
- Questionnaire.
- Discussion done with staff of the Department and some Railways employees.

SECONDARY DATA

Secondary date, on the other hand, is that which have been already collected by someone else and which have already been passed through the statistical process.

- Website
- Books and Magazines.

ACTION PLAN

- Literature survey through various magazines and internet.
- Designing of Questionnaire.
- To visit the respective Terminals.
- Collect the Details and fill up the Questionnaire.
- Analyze the Data Collected.
- Drawing the conclusion recommendation.

SCOPE OF STUDY

At terminal no. of activities which includes handlings of containers trains, equipments, transportation local, warehousing take place all such activities have a financial impact. To analyze that financial impact of handling, warehousing and apart penalty imposed by Indian Railway interm of demmurage, wharfage and detention impact on profitability of the organization.

To identified area for improvement not only interms of financial but interms of services improvement also and customer survey was basically planned to know the difference of services provided by the private train operators in comparison with the Indian Railways and to know that are they satisfied with the services provided by the company.

RATIONAL BEHIND

The report will help out the Halonix Ltd. in saving cost which they pay as a penalty to Indian Railway in term of Demmurage, Wharfage and detention which directly impact on the profitability of Halonix Ltd.

To provide the better service for the customer would defiantly help out the company to improvement themselves where they are lacking and give best to their customers.

To carry out a survey of the terminal operations for the last one year and bring out the key issues which are involved in Terminal Operations. And find out the total amount of Demmurage, Wharefage (if any) and other punitive charges paid by company to the Railways.

Halonix Ltd. has a varied based of customers for whom the end to end services are being provided. And carry out the survey to gauge the customer satisfaction level.

TYPE OF RESEARCH

Descriptive Research design cum Analytical Research Design

Sample Unit

Noida & Greater Noida

Type of sample: Simple random sampling

Sample Size : 90 Respondents

Type of Questions: Close ended and open ended

Type of Questionnaire: Structured and Undisguised

STRUCTURED AND UNDISGUISED QUESTIONNAIRE

For this project a structured questionnaire is used where each question specify the set of responses alternatives and the response format. A structured questionnaire can be of three types multiple choices, dichotomous or a scale. An open ended structured questionnaire is used where the scale is explained above. The questionnaire used here is undisguised, as the respondents clearly know the purpose of this survey and intentions behind it.

ADVANTAGES OF USING STRUCTURED QUESTIONNAIRE

Structured questionnaire is used to reduce the respondent error as employees are aware of the type of information required from them and the purpose of this information.

Structured questionnaire helps in reducing interviewer biasness because the questionnaire is specific and structured and is not open for the interpretations by the interviewer.

LIMITATIONS OF USING STRUCTURED QUESTIONNAIRE

The disadvantage of structured questionnaire is that it increases position or order of biasness order or position bias is defined as the respondent tendency to check an alternative merely because it occupies a certain position or is listed in a certain order.

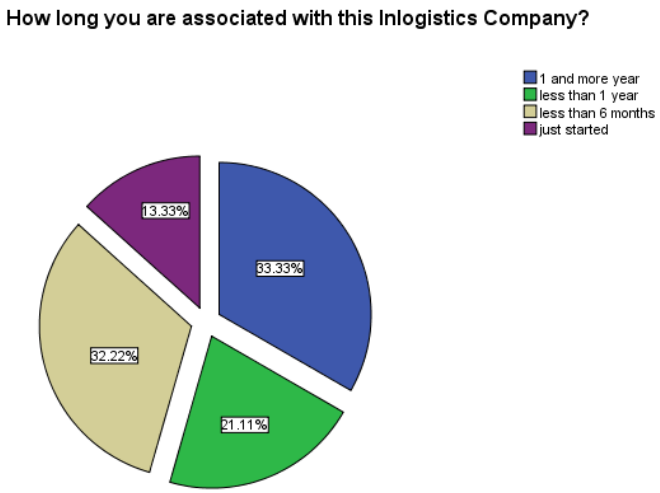
LIMITATIONS OF THE STUDY

- Though the Halonix Ltd. has many terminals from where they do their operations..
- The accuracy of the project and conclusion is totally depending on the accuracy of the data collected and analyzed.
- The result is not same for all season.
- Customers are too busy to contact.
- Too much time is consumed on each call.
- It is possible that some potential source may leave untapped.

CHAPTER-5 DATA ANALYSIS

Q1. How long you are associated with this Halonix Ltd.?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 and more year	30	33.3	33.3	33.3
	less than 1 year	19	21.1	21.1	54.4
	less than 6 months	29	32.2	32.2	86.7
	just started	12	13.3	13.3	100.0
	Total	90	100.0	100.0	

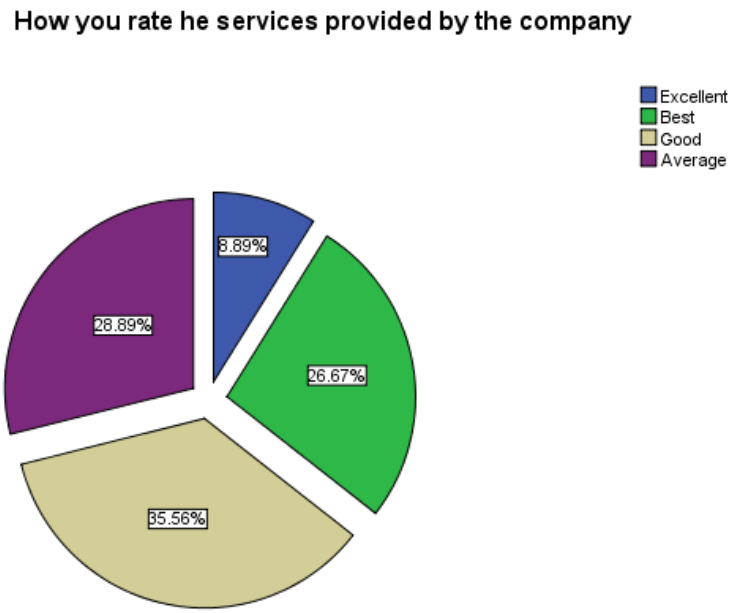


Interpretation

After analyzing the above pie-chart we clearly see that company has 33.3% customer who are dealing with the company more than a year. 21.1% customer are dealing with the company from less than 1 year. 32.3% customers are associated with the company from less than 6 months. 13.3% has just started their business with company. All the above data shows that the company has greater number of old customers than new, this shows that company have goodwill with customers that's why they are still associated with the company.

Q2. How you rate the services provided by the Halonix Ltd.?

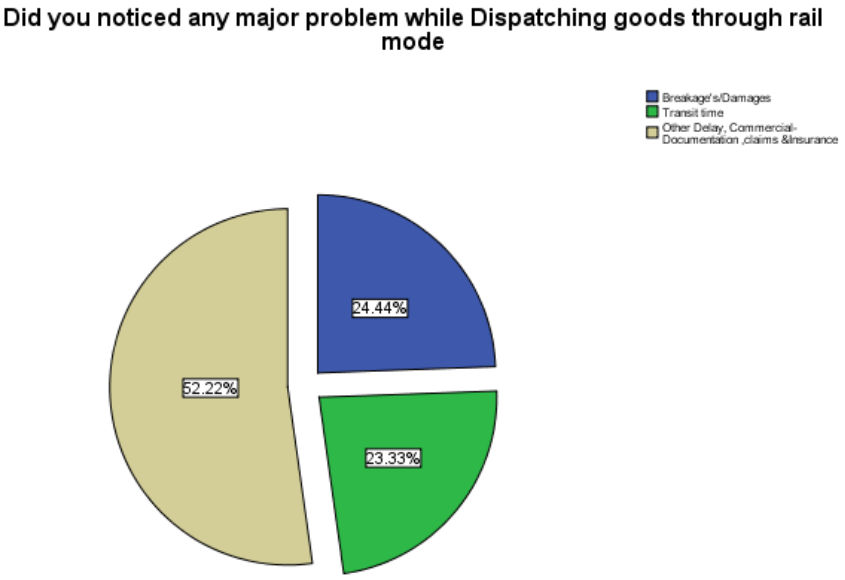
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Excellent	8	8.9	8.9	8.9
	Best	24	26.7	26.7	35.6
	Good	32	35.6	35.6	71.1
	Average	26	28.9	28.9	100.0
	Total	90	100.0	100.0	



Interpretation-- According to the samples we have surveyed we come to the conclusion that 35.6% of samples have said that services provided by the company is good which is less than 50% and only 8.9% suggested that the services are excellent. This shows that the company need to improve its services as the services provided to the customers are not satisfactory. And 28.9% customers rate average services are provided by the company.

Q3. Did you notice any major problem while dispatching goods through rail mode?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Breakage's/Damages	22	24.4	24.4	24.4
	Transit time	21	23.3	23.3	47.8
	Other Delay, Commercial-Documentation ,claims &Insurance	47	52.2	52.2	100.0
	Total	90	100.0	100.0	

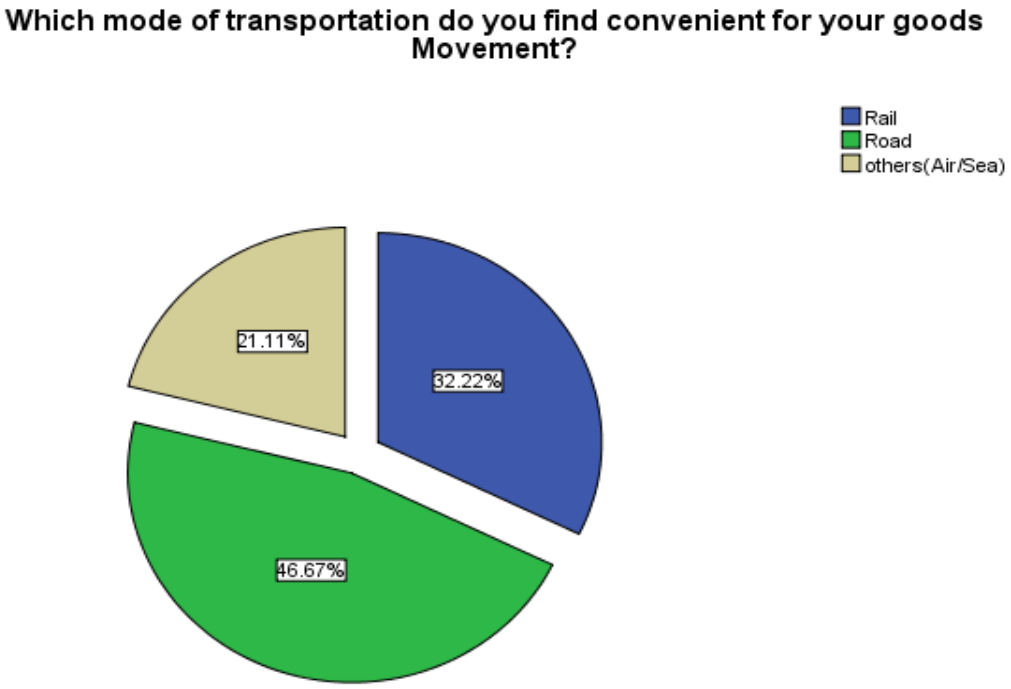


Interpretation

After analyzing the 3rd question, the samples interview shows that 52.2% of the sample get RR (Rail receipt) delay which takes time so the company needs to resolve this problem to improve its services and 24.4% sample customers were having breakages / damages problem while dispatching goods. So the analysis shows that there are some major problems which the company needs to look into so that the customer doesn't face any problem related to breakages and receipt delay. 23.3% of the customer said that they face problem of transit time while dispatching goods through rail mode.

Q4. Which mode of transportation do you find convenient for your goods Movement?

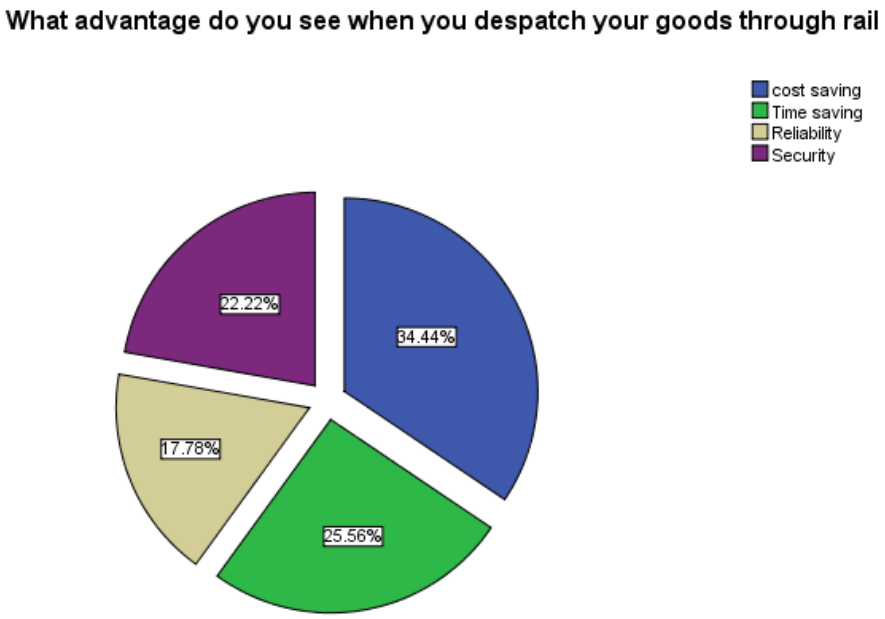
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Rail	29	32.2	32.2	32.2
	Road	42	46.7	46.7	78.9
	others(Air/Sea)	19	21.1	21.1	100.0
	Total	90	100.0	100.0	



Interpretation - After analyzing the 4th question, it concludes that 46.7% customer still have faith on road transport in comparison to rail which is 32.2% and 21.1% customer believe in other mode of transport i.e. Air and Sea.

Q5. What advantage do you see when you dispatch your goods through rail?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	cost saving	31	34.4	34.4	34.4
	Time saving	23	25.6	25.6	60.0
	Reliability	16	17.8	17.8	77.8
	Security	20	22.2	22.2	100.0
	Total	90	100.0	100.0	



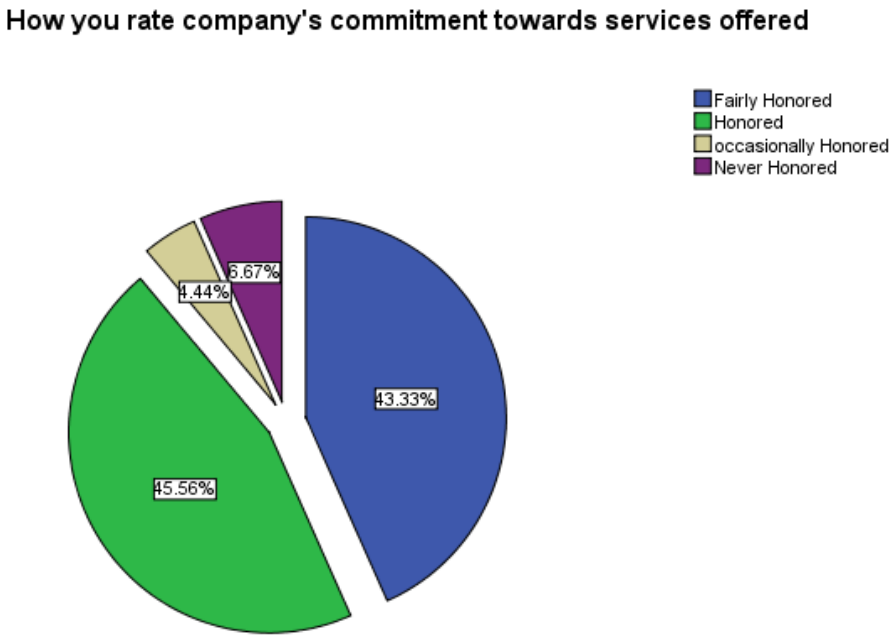
Interpretation

After analyzing the 5th question, we come to know the advantages customer get when they dispatch their goods through rail is cost saving constituting 34.4%, 25.6% said that it is time saving, 22.2% said security and 17.8% customer said reliability.

So the analysis displays that customer prefer rail transport due to less cost and time saving advantages, but very less size says that it reliable. This shows that rail transport is still not considered as a reliable mode of transport.

Q6. How you rate Halonix's commitment towards services offered?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fairly Honored	39	43.3	43.3	43.3
	Honored	41	45.6	45.6	88.9
	occasionally Honored	4	4.4	4.4	93.3
	Never Honored	6	6.7	6.7	100.0
	Total	90	100.0	100.0	

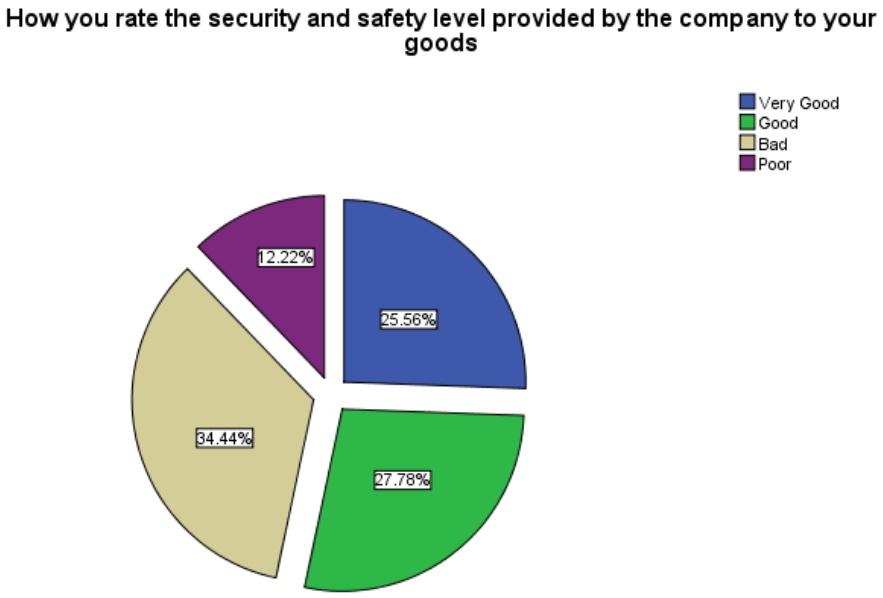


Interpretation

After analyzing the 6th question, 45.6% customer said that the company's commitment towards services offered is honored. And 6.7% customer said it was never honored. This shows that it is good for the company that they are being honored with the good percentage of samples size while only 6.7% said it was never honored. So it is a good sign for the company and its services and company should make more efforts and maintain this thing.

Q7.How you rate the security and safety level provided by Halonix to your goods?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Good	23	25.6	25.6	25.6
	Good	25	27.8	27.8	53.3
	Bad	31	34.4	34.4	87.8
	Poor	11	12.2	12.2	100.0
	Total	90	100.0	100.0	



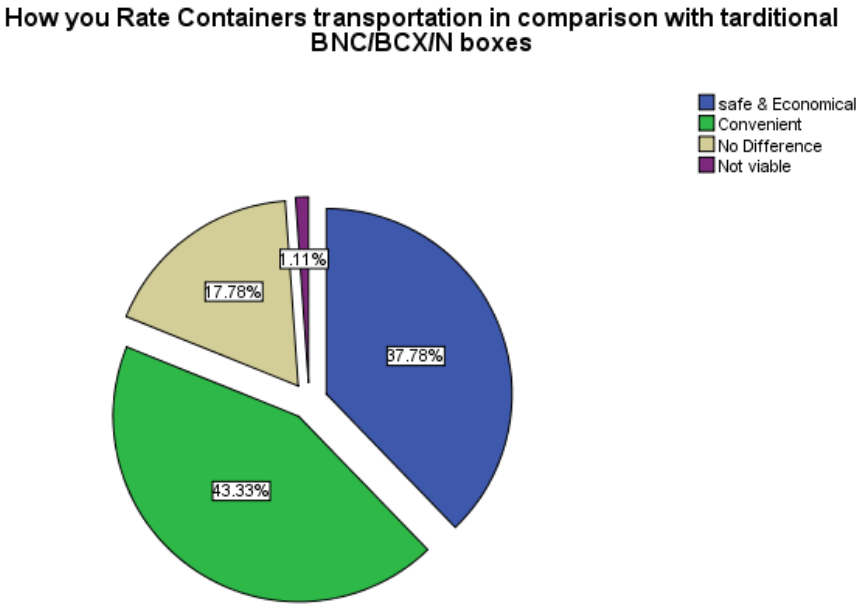
Interpretation

In the above question, Company's security and safety level was measured as it is one of the important parts of service.

After looking on the pie-chart, 34.4% customers said that the security level provided by Halonix Ltd. is not satisfactory or it is bad. And 12.2% customers said it is poor. This shows that customers are not satisfied with the security and safety provided by Halonix Ltd. Halonix Ltd. must do something to overcome this problem.

Q8. How you Rate Containers transportation in comparison with traditional BNC/BCX/N boxes?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	safe & Economical	34	37.8	37.8	37.8
	Convenient	39	43.3	43.3	81.1
	No Difference	16	17.8	17.8	98.9
	Not viable	1	1.1	1.1	100.0
	Total	90	100.0	100.0	



Interpretation

After analyzing, we can say that customer's views are changing with time as 43.3% of the customers prefer containers transportation as more convenient way to transport good rather than the traditional one. And only 1.1% customers said it is not viable. This shows that customers are satisfied with new and modern container transportation than the traditional one. 17.8% said that there is no difference in modern and traditional containers.

CHAPTER-6

FINDINGS

Any research which is conducted in the working place flashes back hidden truths and basic facts, which affects the business of a company directly or indirectly. The main truths are basic facts, which are out coming of the research as findings. The information gathered from the market, which are accountable in the achievement of the objective and for the company, which makes the project more interesting, are basically known findings. The result of assigned project in management studies is known as findings. The findings of this project are as follows:

- Halonix Ltd. should make some changes in their Terminal operation functioning to avoid giving penalties to Railway Authority.
- Halonix Ltd. had paid 1,86,380/- as a demmurage and 5,80,200/- as a wharefage in the month of April. This means the Company pay demmurage and wharefage in one month is approximately 6 to 7 lakhs. As we have gone through given date.
- The labour of the warehouse did not work properly, they work with their own interest.
- Lack of staff for warehouse handling.
- No proper security at the warehouse and also not having sufficient security guards.
- Lack of equipments on working place.
- Sometimes Railway Authority did not listen to Company's problem which they can only solve.
- Some respondents say that Company should have more covered containers which are very less in numbers in comparison to open containers.

- Some respondents suggested that Company should give more emphasis on security and safety of the goods, because many have complained about the missing of goods.
- Some respondents suggested that Company should be quick in dispatching of consignment.
- Still many respondents were happy with the Road Transportation, because it gives them end to end service, like taking goods from your door and delivering to others door.
- There is so much documentation in Rail Transport that some times customers get irritated from it.

CHAPTER-7 RECOMMENDATIONS

- Halonix Ltd. should increase the strength of staff in warehouse.
- Halonix Ltd. must help their customers to get documentations easily and quickly from rail office so that their customer should not face any problem.
- Halonix Ltd. must increase in their number of covered containers which are not easily available sometimes to customers.
- Halonix Ltd. should also try to put GPS systems in their train for knowing their location. This facility is currently not present in their trains.
- The Halonix Ltd. should have warehouse nearby so that they will stock their goods in that warehouse instead of keeping them on Railway Land.
- There should be a proper arrangement of labours at terminals.
- Halonix Ltd. should have all equipment of handling.
- Halonix Ltd. should have dedicated fleet of trucks at terminals.

CONCLUSION

It is concluded that through overall comprehensive study of the primary and secondary data it has been found that Halonix holds a good position in supply chain and logistic field.

In order to be successful in the logistic field, it requires a great deal of commitment and dedication which the company's management definitely has in abundance with the present setup and infrastructure the company seems to have good prospects of growth, with the gradually increasing awareness of the charges they pay as a penalty to railway authority. The company has to take some prompt decisions to create a pioneer position for itself in this field.

The customer response for the services was good and the company needs to make sure that it continues. The company needs to improve in some parts of their services like they must improve their safety and security in trains and Halonix Ltd. should also try to convince the customer for opting the train transport because many customers still have faith in road transportation.

HALONIX'S KEY ENABLERS

- World Wide Real-time Connectivity with suppliers and Company
- SCM Proficiency
- Lowering Its Excess Expenditure
- Single Window Data Access
- Reliable Supplier Support
- Real time Supplier Contact
- Transaction Time Optimization
- First Mover Advantage in implementing State of the art Technologies
- Process Automation Efficiency
- Highest Inventory Management and Tracking
- On spot information on all the departments from Transaction,
- Inventory Balance and Process.

HALONIX'S KEY INHIBITORS

- Technology not fully tested so entering into troubled waters
- Real time Interface problems may occur due to RF Frequency Modulation
- Difficulty in Migration of the technology and adaptability
- Suppliers may be offended due to the pressure in migrating to new technology and process
- Process Redundancy Factors
- Huge Investment into new hardware and software**.**

A biggest threat to Halonix is the possibility of technological changes. Halonix extensively uses technology. Although Halonix has the funds to partake in technological advances, the time and training that is spent improving the technology is a threat to the company. Advances in technology can dramatically alter an industry's landscape, opening up whole new frontiers, and making it possible to produce new and better products at lower costs. On the other hand, technology can also produce significant changes in capital requirements, minimum efficient plant sizes, distribution channels and distribution logistics, and learning or experience curve effect.

When considering international expansion, in some countries the biggest challenge is that there is no organized supply chain

Over reliance on Point of sale data capture can lead to the problem of bull whip effect which needs to take care of in a timely manner.

Developing the responsible base for sourcing, which is compliant to global standards in terms of the kind of labor which is used, the manufacturing practices, and the quality of the product, is critical.

Labor norms in some countries pose as a problem. Unionization exists in some countries which are opposed by Halonix leading to labor problems thus affecting the supply chain. Halonix encounters several conflicts with labor unions. They try to hire

part-time workers to reduce hire costs. On average, workers at Halonix earn $3 dollars per hour less than workers in other major supermarkets, and $1 dollar per hour less than the average retail wage.

Another threat to Halonix is the bargaining power of suppliers. It can create competitive pressures on Halonix. Although they are a large retain chain and typically have considerable negotiating leverage in purchasing products from manufacturers, Halonix still faces the possibility of suppliers escalating their degree of bargaining power.

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WEBSITES

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- http://www.businessline.com
- http://www.expertlogisticsindia.com
- http://www.supplychain.in

APPENDIX
QUESTIONNAIRE

Q1.How long you are Associated with Halonix Ltd.?

a. 1 and more years
b. Less than 1 year
c. Less than 6 months
d. Just started

Q2.How you Rate services provided by Halonix Ltd.?

a. Excellent
b. Best
c. Good
d. Average

Q3.Did you noticed any Major problem while dispatching goods through rail mode?

a. Breakage's/ Damages
b. Transit Time
c. Others-Delay, Commercial- Documentation, Claims & Insurance

Q4.Which mode of Transportation do you find convenient for your goods Movement?

a. Rail
b. Road
c. Other s(Air/ Sea)

Q5. What Advantage do you see when you dispatched your goods through rail?

a. Cost Saving
b. Time saving
c. Reliability
d. Security

Q6. How you Rate Halonix's Commitment towards Services Offered?

a. Fairly Honored

b. Honored

c. Occasionally honored

d. Never Honored

Q7. How you Rate the security and safety level provided by Halonix Ltd. to your goods?

a. Very Good

b. Good

c. Bad

d. Poor

Q8. How you rate freight charged by private train operator?

a. Economical

b. Higher then railway

c. At par with railway

Q9. How you Rate Container s Transportation in Comparison with Traditional BCN/ BCX/N Boxes?

a- Safe & Economical

b- Convenient

C- No Difference

D- Not Viable