GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES
ROLE OF INFORMATION TECHNOLOGY ON SUPPLY CHAIN MANAGEMENT AND IT'S IMPACT ON BUSINESS

Nishi Sangwan
Assistant Professor & Head, Department of Management, Ganga Technical Campus, Soldha, Bahadurgarh (NCR)

ABSTRACT

Supply chain management (SCM) is global operations strategy for achieving organizational competitiveness. Companies are attempting to find ways to improve their flexibility and responsiveness and in turn competitiveness by changing their operations strategy, methods and technologies that include the implementation information technology (IT). This paper focuses the role of Information technology (IT) in supply chain management. It also highlights the contribution of IT in helping to restructure the entire distribution set up to achieve higher service levels and lower inventory and lower supply chain costs. The broad strategic directions which need to be supported by the IT strategy are increasing of frequency of receipts/dispatch, holding materials further up the supply chain and crashing the various lead times. Critical IT contributions and implementations are discussed. Fundamental changes have occurred in today's economy. These changes alter the relationship we have with our customers, our suppliers, our business partners and our colleagues.

It also describes how IT developments have presented companies with unprecedented opportunities to gain competitive advantage. So IT investment is the pre-requisite thing for each firm in order to sustain in the market.

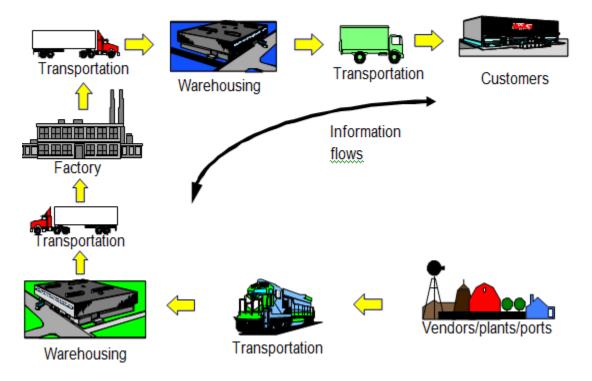*Keywords: Supply Chain Management, Information Technology.*

I. INTRODUCTION

WHAT IS A SUPPLY CHAIN?
Supply chain consists of all parties involved directly or indirectly fulfilling a customer request. The supply chain not only includes the manufacturer and suppliers, but also transportation, warehouses, retailers and customers themselves.

The Immediate Supply Chain for an Individual Firm

II. SUPPLY CHAIN DRIVERS

The goal of a supply chain strategy is to strike the balance between responsiveness and efficiency that result in strategic fit with the competitive strategy.

Most of the companies begin with a competitive strategy and then decide what their supply chain strategy ought to be. The supply chain strategy determines how the supply chain should perform with respect to efficiency and responsiveness. The supply chain must then use the supply chain drivers to reach the performance level the supply chain strategy indicates.

Four Drivers of Supply Chain:
1. Facilities
2. Inventory
3. Transportation
4. Information

Information is the supply chain driver that serves as the glue allowing the other three drivers to work together to create an integrated, coordinated supply chain. Information is crucial to supply chain performance because it provides the foundation on which supply chain process execute transactions and mangers make decisions. Without information, a manager will not know what customers want how much inventory is in stock, and when more products should be produced and shipped. In short, without information a manager can only make decisions blindly. Therefore information makes the supply chain visible to the manager. With this visibility, manager can make decisions to improve supply chain's performance.

455

III. INFORMATION TECHNOLOGY IN SUPPLY CHAIN MANAGEMENT

Information Technology serves as eyes and ears (and sometimes a portion of the brain) of management in a supply chain, capturing and analyzing the information necessary to make a good decision.

In the present day's global competitive environment, the success of logistics and supply chain management is largely conditioned by the extent of use and development of IT. *Supply Chain Management is characterized as transaction oriented and information intensive business function where orders must be entered, processed an tracked; inventory must be received, put away , picked, and shipped; transportation must be arranged and scheduled, followed by generation of required documents and measurements of performance of the whole process*.

For efficient and smooth flow and management of these activities, real-time communication of information is essential. Monthly or quarterly planning is gradually becoming history and being replaced by weekly or even daily planning. It is mainly due to quick information processing and speedy communication service capability of computers. Most of the corporate enterprises are considerably investing in the development of probable integrated

IT infrastructural solutions for Supply chain Management in terms of:
- Electronic Date Interchange (EDI)
- Enterprise Resource Planning (ERP)
- Bar Code System (BCS)
- Intranet, Extranet and Internet
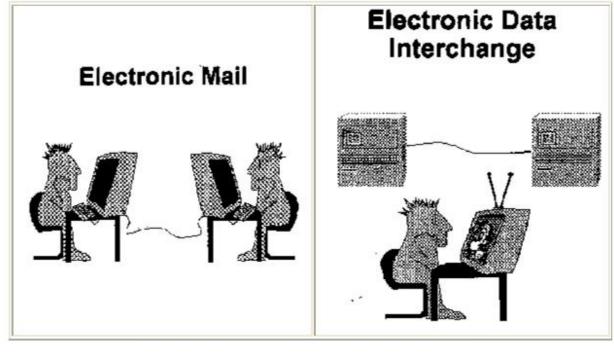
Electronic date interchange (EDI)
Transmission of business transactions from one company's computer to another company's computer. Transmission is achieved through an electronic communication network that uses translation software to convert transactions from a company's internal format to a standard EDI format.

Companies that participate in EDI are referred to as trading partners. Trading partners may be involved in on-line banking, on-line retailing, and electronic funds transfer. There are paperless transactions in an electronic format.
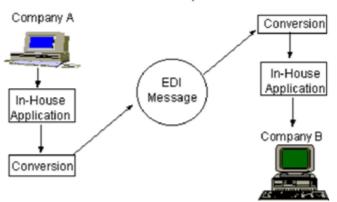
Electronic Mail

Electronic Data Interchange

EDI Basic Components

Company A

In-House Application

Conversion

EDI Message

Conversion

In-House Application

Company B

Electronic Data Interchange, or EDI, is the technique of transferring data between computers to support a business process. EDI can take place on private networks, but is increasingly used over the Internet. For EDI to work successfully there has to be an agreement between most of the companies and organizations involved in the business process.

It involves computer-to-computer exchanges of invoices, orders, and other business documents and therefore effects cost savings and improves efficiency because it minimizes the errors that can occur if the same information has to be typed into computers more than once.

Enterprise resource planning (ERP)
ERP or Enterprise Resource Planning to give it its full name is the term used to describe the automation of core business functions, including production, accounting, distribution, supply chain and human resources. In other words, it's the use of technology to integrate the information from all the key business functions and smooth its flow

457

around the organization.

Appropriate ERP system can create significant efficiencies across business, resulting in timely business information, better customer relationships, a more cost-effective supply chain, improved internal process and, ultimately, increased profitability.

Think of the different systems across your business at the moment, whether manual or automated. A customer places an order. How often is this order entered into various systems in different departments; from finance to distribution to sales and marketing? Not only is this time consuming, but it also creates the opportunity for errors.

Can your finance department quickly query the system in the warehouse to find out if the order has been despatched and whether to raise an invoice? Can your marketing department rapidly identify those customers who have recently ordered specific product lines in order to better target direct marketing activities?

With an ERP system, the customer order information is entered once and then available throughout the business. Every department is better placed to carry out its task and you have clear and more timely information on which to base critical business decisions.

IV. BAR CODE SYSTEM

The accurate and rapid identification of products along with the use of their information in monitoring the entire process comprise the key factors. The bar code system is an identification technology that facilitates speedier flow of logistical information such as quick tracking receipts, movement details, product identification etc; with a lesser probability of error. It refers to the placement of computer-readable codes on items, cartoons and containers which is grouping of parallel bars (usually blocks) of different widths separated by light spaces (usually white) again, of different widths.

These bars (black and white) again, of different widths are used to define a particular character which can be identified by an electronic scanning machine system.

In the bar code system, wide black bars, narrow black bars, wide white (blank) bars and narrow white bars are all used to define a character. Depending on the symbology, there can be anywhere form 3 to 9 elements used in the code for a single character. At present, there are more than 100 symbologies used.

V. INTRANET, EXTRANET AND INTERNET

Intranet is an internal web of an organization, which allows only internal users (company employees) to access and share data through electronic messaging and publishing over the network form eternal sources, while restricting access to it by outsiders.

Extranet is an extension of the corporate Intranet set-up. Extranets operate outside of the firm, connecting suppliers, channel partners, third party logistics service providers and /or users to access and share internal

458

corporate information. Different supply chain members have different access powers and a unique identification, as firm don't wish to give every information to everyone. So, firms are quite selective when building their extranets to ensure that only authorized users have access to only the necessary information pertaining to transaction. By making the connectivity among various players who contribute to the value chain, Extranets focus on improvement of the information transformation system so as to enhance any business strategic alliance for flexible approach.

Internet It provides a huge amount of information to the public. Further, it is transforming the entire nature of supply chains by eliminating the middlemen, making transactions more democratic as well as transparent. So, if a supplier wants to know the production schedule/stock position of his goods or a consumer wants to know the order status/inventory level of a firm's product, he has to simply get connected to the Internet and access the firm's website. Nowadays, Internet is largely used by firms for connectivity.

SAMSUNG ± ITS SUPPLY CHAIN AND LOGISTICS

Samsung is making a big push at streamlining its post sales service through the Net. The firm has invested Rs.2 Crore in connecting its 200 authorized service centers (ASCs) with the head office. It is offering 'customer call logging' under which a customer can register a service call at the site. Once a customer makes an online call at www.samsungindia.com, he/she is given a unique customer ID, detailing the product specifications and customer data. The information goes to the ASC nearest to the customer after which a confirmation mail is sent to the customer (in the metros, the services is provided within 24 hours of registering the call). If the call is not attended to within three days after registration, it is automatically forwarded to the factory-owned service centers. If the call is not attended to within seven days, it goes to the service head office at Noida. The customer is informed at every stage. The four Samsung Zonal Spares Warehouses (ZSWs) will download the order at the end of the day and upload the shipping notification on the net for each trasnsaction. Also, the amount payable by the ASC to the company as well as overall accounts statements will be put on the net – a move that will result in better spares management by reducing the ordering cycle. Also, an EDI system has helped the company linked up with its key suppliers through the Global Logistics Network System (GLONETS). This system links Samsung India's purchase departments with the Samsung headquarters and the international procurement offices in Singapore and sKorea as well as the key company vendors. This is integrated with its HRP systems. The purpose to use it for sharing the production plans so that the Just-in-Time delivery schedule can be fully implemented.

VI. AN EMERGING TECHNOLOGY IN SUPPLY CHAIN MANAGEMENT RFID: RADIO FREQUENCY IDENTIFICATION

The **R**adio **F**requency **Id**entification technology, a popularly known as RFID was first introduced in the 1970's. RFID is a term used for those technologies that use radio waves to identify objects that are affixed with RFID tags.

RFID is technically superior to the prevalent barcode technologies it helps organizations achieve real-time supply chain

visibility. Unlike it helps organizations achieve real-time supply chain
visibility. Unlike barcode readers, which are able to read only one tag at a
time, RFID can read multiple tags at a time thus improving supply
chain productivity by doing away with manual scan processes.

RFID consist of a Radio Frequency (RF) tag with an antenna and an RF reader. The tag emits a signal using the energy released form the RF reader. The signal from the tag on a product specifies a unique 96-it product identification code. Though RFID tags are as small as 350 microns, they have grater capacity for storing information than barcodes labels which can store only 12 to 14 bits of information. The latest generation of RFI technology can work using the Internet. The unique product identifier is hyperlinked to additional information, including production details, manufacturing batch, product handling, storage and delivery instructions, expiration

date and other important information. RFID can fundamentally change the way organizations deal with inventory and information sharing which can significantly improve supply chain management.

Supply chain managers need to understand how they can leverage RFID technology for enhancing competitive advantage. RFID tags are affixed to shipping cases, pallets, cartoons and carets for tracking goods through the supply chain, starting from factory to distribution center to company warehouse and finally , to the store. Item tagging ensures real-time stock visibility allowing retailers to reorder specific items, the moment they are sold. This can help in developing profiles of customer behavior, their needs and preferences, spending patterns , giving the retail company insights to develop a more customized and relevant shopping experience. Successful RFID technology implementation may help an organization in the form of reduced inventories, improved service levels, reduction in wastage, higher safety and overall reduction in prices.

Advanced planning is required to successfully implement the RFID technology. Enterprise applications that need to be linked with supply chain including ERP and CRM application, do not integrate directly with RFID systems. Organizations planning to implement RFID technology need to analyze how best to manage the flow of data from the reader to application and to the user through middleware. Failure to resolve systems integration issues could significantly reduce the return from RFID investments. Another negative aspect of RFID is the violation of consumer privacy. Product based RFID can allow companies to query products at any location which would make consumers uncomfortable as they will treat it as violation of their privacy

RFID in India

To promote the adoption and use of RFID technology across the industries, RFID Association of India (RFIDAI) has been formed, which has planned to collaborate with like-minded entities to write, educate and promote RFID. It will encourage Indian Industries to establish leadership position in the global market and team up with international organizations with the same interests. It is estimated that in the world around 2000 projects are going on. If Indian industries capitalize on this opportunity, their aim of leading the RFID – aided business is easily achievable. The RFID market comprising tags, readers, software services will; be as big as $4.2bn. India has begun its serious studies to build a silicon foundry to produce next generation wireless chips and empower the industries with this technology

VII.   CONCLUSION

Conducting business has become increasingly complex. The various factors leading to this development are increasing product variety and volumes, increasing competition, shrinking product, life cycles and growing customer demands. To manage this complexity effectively in a real time basis for a business, information sharing across functions and locations has become critical. Flexibility and responsiveness has become key business drivers for the 21st century, forcing businesses to orient themselves along processes instead of functions. It is in this aspect of management that the use of information technology assumes a greater significance. Supply chains, supported by effective information technology usage, represent a major force driving industrial progress and structural changes, enabling both countries and companies to become more competitive and to increase their share of international trade