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EMERGING TRENDS IN MANAGEMENT

MODULE 1

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MODULE 1
SUPPLY CHAIN MANAGEMENT
INTRODUCTION
The supply chain, which is also referred to as the logistics network, consists of suppliers, manufacturing centres , warehouses, distribution centres, and retail outlets, as well as raw materials, work-in-process inventory, and finished products that flow between the facilities . In a typical supply chain, raw materials are procured and items are produced at one or more factories, shipped to warehouses for intermediate storage, and then shipped to retailers or customers. Consequently, to reduce cost and improve service levels, effective supply chain strategies must take into account the interactions at the various levels in the supply chain.

MEANING AND DEFINITION OF SUPPLY CHAIN MANAGEMENT:
The **supply chain** is the network of organizations that are involved through upstream and downstream linkages in the different process and activities that produce value in the form of products and services in the hands of ultimate customers. **Supply chain management** is an external integration of interrelated functions of the firm with its channel members, vendors, and all third-party logistics service providers who contribute in the flow of goods (raw materials, semi-finished and finished products) and related information from the point of inception to the point of consumption with efficiency. It can be defined as:

"Supply chain management is a set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimize system wide costs while satisfying service level requirements."

This definition leads to several observations. First, supply chain management takes into consideration every facility that has an impact on cost and plays a role in making the product conform to customer requirements: from supplier and manufacturing facilities through warehouses and distribution centres to retailers and stores. Indeed, in some supply chain analysis, it is necessary to account for the suppliers' suppliers and the customers' customers because they have an impact on supply chain performance.

Second, the objective of supply chain management is to be efficient and cost effective across the entire system; total system wide costs, from transportation and distribution to inventories of raw materials, work in process, and finished goods, are to be minimized. Thus, the emphasis is not on simply minimizing transportation cost or reducing inventories but, rather, on taking a systems approach to supply chain management. Finally, because supply chain management revolves around efficient integration of suppliers, manufacturers, warehouses, and stores, it encompasses the firm's activities at many levels, from the strategic level through the tactical to the operational level.

The definition of supply chain management developed and used by The Global Supply Chain Forum: "Supply Chain Management is the integration of key business

processes from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders."

THE EVOLUTION OF SUPPLY CHAIN MANAGEMENT

In the 1980s, companies discovered new manufacturing technologies and strategies that allowed them to reduce costs and better compete in different markets. Strategies such as just-in-time manufacturing, lean manufacturing, total quality management etc. and vast amounts of resources were invested in implementing these strategies. Unfortunately, this huge investment typically includes many unnecessary cost components due to redundant stock, inefficient transportation strategies, and other wasteful practices in the supply chain. For instance, experts believe that the grocery industry, a notoriously low-margin industry, can save about $30 billion, or 10 percent of its annual operating cost, by using more effective supply chain strategies . To illustrate this issue, consider the following two
examples:

1. It takes a typical box of cereal more than three months to get from the factory to a supermarket.
2. It takes a typical new car, on average, 15 days to travel from the factory to the dealership. This lead time should be compared with the actual travel time, which is no more than four to five days. Where transportation cost is by far the largest cost component; inventory cost is slightly higher than half of the transportation costs.

Thus, in the 1990s many companies focused on strategies to reduce their costs as well as those of their supply chain partners. For example Procter & Gamble estimates that it saved retail customers $65 million in a recent 18-month supply chain initiative. "According to Procter & Gamble, the essence of its approach lies in manufacturers and suppliers working closely together . . . jointly creating business plans to eliminate the source of wasteful practices across the entire supply chain".

As the example suggests, an important building block in effective supply chain strategies is strategic partnerships between suppliers and buyers, partnerships that can help both parties reduce their costs. Indeed, manufacturers such as Procter & Gamble and Kimberly-Clark and giant retailers like Wal-Mart have used strategic partnering as an important element in their business strategies. Firms such as 3M, Eastman Kodak, Dow Chemical, Time Warner, and General Motors turned over large portions of their logistics operations to third party logistics providers (3PLS- service of external agencies/organizations that could handle non value adding services). At the same time, many supply chain partners engage in information sharing so that manufacturers are able to use retailers' up-to-date sales data to better predict demand and reduce lead times. This information sharing also allows manufacturers to control the variability in supply chains (known as the bullwhip effect) and by doing that reduce inventory and smooth out production. Among the first companies to utilize real-time information was Milliken and Company, a textile and chemicals company. Milliken worked with several clothing suppliers and major department stores, all of which agreed to use data from the department stores to "synchronize" their ordering and manufacturing plans. The lead time from order receipt at Milliken's textile plants to final clothing receipt at the department stores was reduced from 18 weeks to 3 weeks. The huge pressure during the 90s to reduce costs and increase profits pushed

many industrial manufacturers towards outsourcing; firm considered outsourcing everything from the procurement function to production and manufacturing. Indeed, in the mid 90s there was a significant increase in purchasing volume as a percentage of the typical firm's total sales. More recently, between 1998 and 2000, outsourcing in the electronic industry has increased from 15 percent of all components to 40 percent. Finally, in the late 90s (2000), the Internet and the related e-business models led to expectations that many supply chain problems would be solved merely by using these new technologies and business models. E-business strategies were supposed to reduce cost, increase service level, and increase flexibility and, of course, increase profits, albeit sometime in the future. In reality, these expectations frequently were not met, as many e businesses
failed. In many cases, the downfall of some of the highest-profile Internet businesses can be attributed to their logistics strategies.

The Internet introduced new channels and helped to enable the direct-to-consumer business model. These new channels required many companies to learn new skills, and added complexity to existing supply chains. The landscape has changed in recent years. Industry recognized that trends, including outsourcing, off shoring, lean manufacturing, and just-in-time that focus on reducing manufacturing and supply chain costs significantly increase the level of risk in the supply chain. As a result, over the past several years, progressive firm have started to focus on strategies that find the right balance between cost reduction and risk management. A number of approaches have been applied by industry to manage risk in their supply chains:

- Building redundancy into the supply chain so that if one portion fails, for example, a fire at a warehouse or a closed port, the supply chain can still satisfy demand.
- Using information to better sense and respond to disruptive events.
- Incorporating flexibility into supply contracts to better match supply and demand.
- Improving supply chain processes by including risk assessment measures.
- Using service of fourth-party logistics (4PLS) - The 4PLS is a supply chain integrator that assembles and manages the resources, capital, technology and capabilities of its own organization and other organizations who provide complementary service to design, build, and deliver a comprehensive supply chain solution.(outsourcing entire supply chain process from a single organization)

The implementation of ERP systems(Enterprise Resource Planning), motivated in many companies by year 2000 concerns, as well as new technology such as tools for supplier performance assessments, have created opportunities to improve supply chain resiliency and responsiveness. Similarly, advanced inventory planning systems are now
used to better position inventory in the supply chain, and to help firms better understand the impact of product design alternatives on supply chain costs and risks, thus facilitating the integration of the development chain and the supply chain.

The urgency of supply chain challenges has not diminished over the years with the recent increase in supply chain costs. With complexity driven by globalization, high transportation costs, poor infrastructure, weather-related disasters, and terrorist threats, managing the supply chain has become even more challenging.

SUPPLY CHAIN COMPONENTS/PARTICIPANTS

Supply chain participants generally include:

1. **Raw materials providers.** Raw materials providers sell raw materials like steel, fuel or other commodities to manufacturers who need these to run their operations or incorporate into the goods that they manufacture. Raw materials providers also sell raw materials to others in the supply chain for resale or consumption.
2. **Manufacturers.** Manufacturers manufacture or produce:
   a) their own off-the-shelf products; or
   b) Custom products based on third-party specifications.

   The term manufacturer is also used to refer to a product manufacturer or producer that outsources the actual manufacture or production of its products to a third party. Manufacturers sell their goods to others in the supply chain for resale, but also sell goods directly to end users for consumption.
3. **Distributors.** Distributors are typically middlemen that purchase goods from manufacturers or other middlemen for their own account with the intention of reselling
   them to others in the supply chain, for example:
   a) Wholesalers
   b) End users, for example, consumers or companies that need the goods.

   Distributors also include manufacturers that distribute their own products. Distributors typically bear inventory risk and the risk of loss regarding the goods, as well as credit risk related to their customers.
4. **Resellers.** The meaning of "reseller" varies from industry to industry. A reseller may refer to an entity that purchases goods from manufacturers or distributors with the intention of reselling them to end users for consumption or incorporation into another product. A reseller that resells goods to consumers is commonly referred to as a retailer. Resellers typically bear inventory risk and the risk of loss regarding the goods, as well as credit risk related to their customers.
5. **Franchisers.** Franchisers are owners of business systems and processes who grant one or more third parties (franchisees) the right to use their business systems or processes, as well as ***trademarks*** or trade names to produce and market goods (or services) according to uniform specifications in exchange for a one-time franchise fee plus a percentage of sales revenue (royalty).
6. **Sales representatives.** Sales representatives market, advertises, promote and solicit the sale of the goods on behalf of the seller (such as a manufacturer or distributor) to the seller's customers in the specified territory. Sales representatives do not take title to the goods or bear inventory risk or risk of loss regarding the goods. They also do not bear the credit risk of the customers.
7. **Logistics providers.** These entities provide a variety of services on behalf of other participants in the supply chain to move the goods between the participants. Logistics providers may take temporary custody of the goods, but do not take title to the goods. Logistics providers include:
   a) warehousemen, which are entities engaged in the business of storing goods for hire;
   b) carriers, which are entities like trucking companies that issue bills of lading; and

c) Customs brokers, which are entities engaged in the business of clearing goods through customs barriers for importers and exporters.

8. **Financiers.** In addition to sellers who provide seller-financing, such as extended or deferred payment terms, these entities include banks, factoring companies and other entities who provide:

a) purchase-money financing for a buyer to pay the purchase price of goods;

b) commercial letters of credit to buyers to further the payment of goods in the ordinary course of a transaction; or

c) Factoring to sellers who sell or assign their ***receivables*** to accelerate their cash flow.

9. **Credit support providers.** These entities provide credit support to any party that is insecure about the payment or other obligations of the other party, for example:

a) banks that issue standby letters of credit; and

b) Sureties like insurance companies that provide surety bonds.

10. **End users.** These include any participant in the supply chain who purchases goods for:

a) their own use or consumption; or

b) Incorporation as raw materials or components into their own products.

11. **Lessor.** Some users do not own the goods (for example, equipment) that they use in their businesses. Rather, they lease equipment from others in the supply chain who own the equipment. The party that owns the equipment is commonly referred to as the lessor. The party that has the exclusive right to use the equipment is commonly referred to as the lessee. Lessor and lessees engage in equipment leasing for a variety of reasons including:

a) allocation of the equipment's life-cycle between the parties;

b) tax advantages; and

c) Accounting treatment.

THE CONCEPT OF SUPPLY CHAIN MANAGEMENT

Companies are increasingly emphasising on their *core competencies* (‘to do what you are best at and leave all other non-value-added activities to more suited players.’) and working on to build strong relationships with their supply chain partners who possess essential complementary capabilities. Success will depend on *how well companies collaborate* to manage important processes and activities across company boundaries to better meet customer requirements and demand. The efforts to *align* goals, share resources, and collaborate across company boundaries are the essence of supply chain management.

OBJECTIVES OF SUPPLY CHAIN MANAGEMENT

The fundamental objective is to "*add value".* That brings us to the example of the fish fingers. During the Supply Chain Management'98 conference in the United Kingdom this fall, a participant in a supply chain management seminar said that total time from fishing dock through manufacturing, distribution, and final sale of frozen fish fingers for his European grocery-products company was 150 days. Manufacturing took a mere 43 minutes. That suggests an enormous target for supply chain managers. During all that time, company capital is-almost literally in this case--frozen. What is true for fish fingers is

true of most products. Examine any extended supply chain, and it is likely to be a long one. James Morehouse, a vice president of consulting firm A.T. Kearney, reports that the total cycle time for corn flakes, for example, is close to a year and that the cycle times in the pharmaceutical industry average 465 days. In fact, Morehouse argues that if the supply chain, of what he calls an "extended enterprise," is encompassing everything from initial supplier to final customer
fulfilment, could be cut to 30 days, that would provide not only more inventory turns, but fresher product, an ability to customise better, and improved customer responsiveness. "All that add value," he says. And it provides a clear competitive advantage. Supply Chain Management becomes a tool to help accomplish corporate strategic objectives:

a) reducing working capital,
b) taking assets off the balance sheet,
c) Accelerating cash-to-cash cycles,
d) Increasing inventory turns, and so on.

SUPPLY CHAIN PLANNING

Supply Chain Planning enables manufacturers to synchronize enterprise-wide production and supply with enterprise-wide demand. The solution allows manufacturers to aggregate total demand and centrally plan for the production capacity and supplies required to satisfy that demand. Supply Chain Planning consolidates sales, production, inventory and purchasing information to help companies become more demand-driven and actually manufacture items based on real demand. In today's demand-driven market, it is critical for manufacturers to optimize and integrate sales and logistics and incorporate such data into the production schedule in a timely manner. Supply Chain Planning delivers substantial benefits to manufacturers including:

1. Increased responsiveness to market changes
2. Improved visibility into aggregated demand as well as enterprise-wide production and supply
3. Reduced inventory levels
4. Improved customer service and on-time delivery performance
5. Optimized supply to meet demand profitably
6. Lowered inventory, distribution and transportation costs
7. Increased demand forecast accuracy with compressed planning cycle times

Move Planning Closer to Demand:

Supply Chain Planning helps manufacturers increase responsiveness by shifting the planning process closer to actual demand. Manufacturers can then more effectively synchronize production and procurement activities with actual demand and in the process lower costs, decrease inventory levels, and improve customer service. By synchronizing internal and external supply chain processes, Supply Chain Planning helps manufacturers transform themselves into demand-driven organizations that are more flexible and can respond quickly to changes in the market.

Total Demand Visibility:

Supply Chain Planning increases manufacturers' visibility into enterprise-wide demand by aggregating forecasts and sales orders created by customers and local sales

offices into one, comprehensive demand stream. This demand stream can be organized in a wide variety of ways — by corporate entity, customer, customer type, product family or end-item — to allow corporate planners to see when, where and what kind of demand is being generated. The enterprise planning solution provides users with complete visibility into aggregated demand through a single, easy-to-use screen. Planners can adjust this demand based on the historic accuracy of the various demand streams.

Enterprise-wide Planning:

Supply Chain Planning provides visibility into demand and also allows manufacturers to determine the optimal way to fulfil that demand based on available enterprise-wide supply and production resources. From the same screen, planners can see the production and inventory required to meet demand in user-defined time-buckets.

Supply Chain Planning allows users to drill into demand details to see how supporting production and supply plans were created as well as to make any changes necessary to meet the demand or achieve business objectives more effectively. This ability to plan production and procurement activities centrally against aggregated demand is essential for manufacturers who wish to realize strategic business objectives such as cost reduction or improved responsiveness.

The enterprise planning capabilities enables manufacturers to allocate demand intelligently to the most appropriate production facility based on lowest manufacturing cost or available resources including capacities and inventories, transport costs, and lead times from facility to customer.

Supply Chain Planning ensures that manufacturers optimize their production and procurement activities on an enterprise-wide basis. The module enables planners to allocate demand to individual factories for further planning and fulfilment.

Support for Global PSI Planning:

Supply Chain Planning provides full support for Global PSI (Production, Sales, and Inventory) planning commonly used by leading electronics and high-volume manufacturers. The solution contains a global model of production resources and inventory that can be used to fulfil demand. The Global PSI model is created from multiple Local PSI models generated from the production planning or materials planning systems in use at each factory.

Key Capabilities:

Supply Chain Planning provides advanced capabilities for manufacturers, including:

- Accurate visibility of demand across product lines, geographies and customers by aggregating information from multiple sources
- Accurate visibility of enterprise-wide production capacity and supply requirements
- Optimization of key activities within a manufacturer including production, procurement and distribution
- Multi-tier, multi-enterprise planning collaboration between trading partners.

SUPPLY CHAIN MANAGEMENT PROCESS

The Global Supply Chain Forum identified eight key processes that make up the core of supply chain management:

- Customer Relationship Management
- Customer Service Management
- Demand Management
- Order Fulfillment
- Manufacturing Flow Management
- Procurement (supplier relationship management)
- Product Development and Commercialization
- Returns (returns management).

The term "procurement" is defined as "...the act of buying... all those activities necessary to acquire goods and services consistent with user requirements" The procurement process renamed as "supplier relationship management". The name of the returns process to returns management. The eight key business processes run the length of the supply chain and cut across firms and functional silos within each firm. Functional silos include Marketing, Researchand Development, Finance, Production, Purchasing and Logistics. Activities in these processes reside inside a functional silo, but an entire process will not be contained within one function. Each process is described at strategic and operational levels. The strategic portion consists of the establishment and strategic management of each process, and provides a blueprint for implementation.This is a necessary first step in integrating the firm with other members of the Supply chain. The operational portion is the actualization of the process once it has been established.

customer relationship management

The customer relationship management process provides the structure for how the relationship with the customer is developed and maintained. Management identifies key customers and customer groups to be targeted as part of the firm's business mission.Customer teams tailor Product and Service Agreements (PSA) to meet the needs of key accounts and segments of other customers.

Teams work with key accounts to improve processes, and eliminate demand variability and non-value-added activities. Performance reports are designed to measure the profitability of individual customers as well as the firm's financial impact on those customers.

Customer Service Management

The customer service management process is the firm's face to the customer. It provides the single source of customer information, such as product availability, shipping dates and order status. Real-time information is provided to the customer through interfaces with the firm's functions, such as manufacturing and logistics. Customer service management is responsible for administering the PSA.

Demand Management

The demand management process needs to balance the customers' requirements with the firm's supply capabilities. This includes forecasting demand and synchronizing it with production, procurement, and distribution. "Demand Management coordinates all acts of the business that place demand on manufacturing capacity".
The process is also concerned with developing and executing contingency plans when operations are interrupted

Customer Order Fulfilment

A key to effective supply chain management is to meet customer requirements in terms of order fulfillment . Effective order fulfillment requires integration of the firm's manufacturing, logistics and marketing plans. The firm should develop partnerships with key members of the supply chain to meet customer requirements and reduce total delivered cost to customers.

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Manufacturing Flow Management

The manufacturing flow process deals with making the products and establishing the manufacturing flexibility needed to serve the Review Manufacturing, Sourcing, Marketing target markets. The process includes all activities necessary for managing the product flow through the manufacturing facilities and for obtaining, implementing and managing flexibility. encompasses creating the overall manufacturing plan, performing the detailed planning of materials and capacity needs, and executing these plans.
Next, capacity and demand are synchronized. This step identifies what inventory levels are needed for synchronizing the activities of the many supply chain members. Inventory includes raw materials, work-in-process, sub-components, and packaging at the different tiers. This step requires input from demand management and order fulfillment, and provides output to customer service management.
The final step in the manufacturing flow process, measuring performance, includes more than just tracking process measures, and reporting them to the customer relationship management and supplier relationship management teams. It includes analyzing product quality and examining the root causes of quality problems. The manufacturing flow process team is responsible for finding solutions to quality issues. This might involve working with supplier relationship management, product development and commercialization, or returns management.

Supplier Relationship Management (Procurement management)

Supplier relationship management is the process that defines how a company interacts with its suppliers. As the name suggests, this is a mirror image of customer relationship management. Just as a company needs to develop relationships with its customers, it needs to foster relationships with its suppliers. As in the case of customer relationship management, a company should forge close relationships with a small subset of its suppliers, and maintain more traditional relationships with the others. Each supplier agrees to a PSA that defines the terms of the relationship. Supplier relationship management is about defining and managing these PSAs.

Product Development and Commercialization

Product development is critical to the continuing success of the firm. Developing new products quickly and getting them to the marketplace in an efficient manner is a major component of corporate success. Time to market is a critical objective of this process. Supply chain management includes integrating customers and suppliers into the product development process in order to reduce time to market. As product life cycles shorten, the right products must be developed and successfully launched in ever-shorter timeframes in order to remain competitive.

Returns Management

Effective returns management is a critical part of supply chain management. While many firms neglect the returns process because management does not believe it is important, this process can assist the firm in achieving a sustainable competitive advantage. Effective management of the returns process enables the firm to identify productivity improvement opportunities and breakthrough projects.

Implementing Integrated Supply Chain Management

The implementation of supply chain management involves identifying the supply chain members with whom it is critical to link, the processes to be linked with each of these key members, and the type/level of integration that applies to each process link. The objective of supply chain management is to create the most value for the entire supply chain network, including the end-customer. Successful supply chain management involves the coordination of activities within the firm and between members of the supply chain. Consequently, supply chain process integration and reengineering initiatives should be aimed at boosting total process efficiency and effectiveness across the supply chain. Although the functional expertise remains in place, implementing supply chain management requires making the transition from a functional organization to one focused on business processes first inside the firm and then across firms in the supply chain. If the proper coordination mechanisms are not in place across the various functions, the supply chain processes will be neither effective nor efficient. By taking a process focus, all functions that touch the product or provide information must work together. For example, purchasing depends on sales and marketing data fed through a production schedule to assess specific order levels and timing of requirements. These orders drive production requirements that, in turn, are transmitted upstream to suppliers.The increasing use of outsourcing has accelerated the need to coordinate supply chain processes since the organization becomes more dependent on suppliers. Consequently, coordination mechanisms must be in place within the organization. Where to place these coordination mechanisms, and which teams and functions are responsible for managingthem become critical decisions.

The requirements for successful implementation of supply chain management include:

- Executive support, leadership and commitment to change.
- An understanding of the degree of change that is necessary.
- Agreement on the supply chain management vision and the key processes.
- The necessary commitment of resources and empowerment to achieve the stated goals.

MODULE 2

INTRODUCTION

As far back as history records, the goods that people wanted were not always produced where they wanted to consume them, or these goods were not accessible when people wanted to consume them. Food and other commodities were widely dispersed and were only available in abundance at certain times of the year. Early peoples had the choice of consuming goods at their immediate location or moving the goods to a preferred site and storing them for later use. However, because no well developed transportation and storage systems yet existed, the movement of goods was limited to what an individual could personally move, and storage of perishable commodities was possible for only a short time. This limited movement-storage system generally constrained people to live close to the sources of production and to consume a rather narrow range of goods. Even today, in some areas of the world consumption and production take place only within a very limited geographic region. Striking examples can still be observed in the developing nations of Asia, South America, Australia, and Africa, where some of the population live in small, self-sufficient villages, and most of the goods needed by the residents are produced or acquired in the immediate vicinity. Few goods are imported from other areas. Therefore,
production efficiency and the economic standard of living are generally low. In this type of economy, a well-developed and inexpensive logistics system would encourage an exchange of goods with other producing areas of the country, or even the world. As logistics systems improved, consumption and production began to separate geographically. Regions would specialize in those commodities that could be produced most efficiently. Excess production could be shipped economically to other producing (or consuming) areas, and needed goods not produced locally were imported. This exchange process follows the principle of comparative advantage. This same principle, when applied to world markets, helps to explain the high level of international trade that takes place today. Efficient logistics systems allow world businesses to take advantage of the fact that lands, and the people who occupy them, are not equally productive. Logistics is the very essence of trade. It contributes to a higher economic standard of living for us all. To the individual firm operating in a high-level economy, good management of logistics activities is vital. Markets are often national or international in scope, whereas production may be
concentrated at relatively few points. Logistics activities provide the bridge between production and market locations that are separated by time and distance. Effective

management of these activities is the major concern of this Program.

MEANING AND DEFINITION OF LOGISIC MANAGEMENT

The benefits of co-ordinated logistics management appeared around 1961, in part explaining why a generally accepted definition of business logistics is still emerging.
Therefore, it is worthwhile to explore several definitions for the scope and content of the subject. A dictionary definition of the term logistics is:
"The branch of military science having to do with procuring, maintaining, and transporting material, personnel, and facilities."
This definition puts logistics into a military context. To the extent that business objectives and activities differ from those of the military, this definition does not capture the essence of business logistics management. A better representation of the field may be reflected in the definition promulgated by the Council of Logistics Management (CLM), a professional organization of logistics managers, educators, and practitioners formed in 1962 for the purposes of continuing education and fostering the interchange of ideas. Its definition: "Logistics is that part of the supply chain process that plans, implements, and controls the efficient, effective flow and storage of goods, services, and related information from the point of origin to the point of consumption in order to meet customers' requirements." This is an excellent definition, conveying the idea that product flows are to be managed from the point where they exist as raw materials to the point where they are finally discarded. Logistics is also concerned with the flow of services as well as physical goods, an area of growing opportunity for improvement.
It also suggests that logistics is a process, meaning that it includes all the activities that have an impact on making goods and services available to customers when and where they wish to acquire them. However, the definition implies that logistics is part of the supply chain process, not the entire process. Although early definitions such as physical distribution, materials management, industrial logistics and channel management - all terms used to describe logistics – have promoted this broad scope for logistics, there was little attempt to implement logistics beyond a company's own enterprise boundaries, or even beyond its own internal logistics function. Now, retail firms are showing success in sharing information with suppliers, who in turn agree to maintain and manage inventories on retailers' shelves. Channel inventories and product stock outs are lower. Manufacturing firms operating under just-in-time production scheduling build relationships with suppliers for the benefit of both companies by reducing inventories.

SIGNIFICANCE OF LOGISTICS

Logistics is about creating value - value for customers and suppliers of the firm, and value for the firm's stakeholders. Value in logistics is primarily expressed in terms of time and place. Products and services have no value unless they are in the possession of the customers when (time) and where (place) they wish to consume them. For example, concessions at a sports event have no value to consumers if they are not available at the time and place that the event is occurring. Good logistics management views each activity in the supply chain as contributing to the process of adding value. If little value can be added, it is questionable whether the activity should exist. However, value is added when customers are willing to pay more for a product or service than the cost to place it in their hands. To many firms throughout the world, logistics has become an increasingly important value-adding process for a number of reasons.

Costs Are Significant

According to the International Monetary Fund (IMF), logistics costs average about 12 percent of the world's gross domestic product. Robert Delaney, who has tracked logistics costs for more than two decades, estimates that logistics costs for the U.S. economy are 9.9 percent of the U.S. gross domestic product (GDP), or $921 billion. For the firm, logistics costs have ranged from 4 percent to over 30 percent of sales. Logistics costs, substantial for most firms, rank second only to the cost of goods sold (purchase costs) that are about 50 percent to 60 percent of sales for the average manufacturing firm. Value is added by minimizing these costs and by passing the benefits on to customers and to the firm's shareholders.

Logistics Customer Service Expectations Are Increasing

The Internet, just-in-time operating procedures, and continuous replenishment of inventories have all contributed to customers expecting rapid processing of their requests, quick delivery, and a high degree of product availability. In most of the companies finished goods inventory turnover is 20 or more times per year Total order cycle time of five working days Transportation cost of one percent of sales revenue or less, if products sold are over $5 per 500 gms As might be expected, the average company performs below these cost and customer service benchmarks. Supply and Distribution Lines Are Lengthening with Greater Complexity The trend is toward an integrated world economy. Firms are seeking, or have developed, global strategies by designing their products for a world market and producing them wherever the low-cost raw materials, components, and labour can be found (e.g., Ford's Focus automobile), or they simply produce locally and sell internationally. In case, supply and distribution lines are stretched, as compared with the producer who wishes to manufacture and sell only locally? Not only has the trend occurred naturally by firms seeking to cut costs or expand markets, but it is also being encouraged by political arrangements that promote trade. Examples of the latter are the European Union, the North America Free Trade Agreement (NAFTA) between Canada, the United States, and Mexico, and the economic trade agreement among several countries of South America (MERCOSUR).

Globalization and internationalization of industries everywhere will depend heavily on logistics performance and costs, as companies take more of a world view of their operations. As this happens, logistics takes on increased importance within the firm since its costs, especially transportation, become a larger part of the total cost structure. For example, if a firm seeks foreign suppliers for the raw materials that make up its final product or foreign locations to build its product, the motivation is to increase profit. Material and labor costs may be reduced, but logistics costs are likely to increase due to increased transportation and inventory costs. The "trade off", may lead to higher profit by reducing materials, labour, and overhead costs at the expense of logistics costs and tariffs.

"Outsourcing" adds value, but it requires careful management of logistics costs and product-flow times in the supply channel.

Logistics Is Important To Strategy

Firms spend a great deal of time finding ways to differentiate their product offerings from those of their competitors. When management recognizes that logistics/SC affects a significant portion of a firm's costs and that the result of decisions made about the supply chain processes yields different levels of customer service, it is in a position to use this effectively to penetrate new markets, to increase market share, and to increase profits. That is, good supply chain management can generate sales, not just reduce costs.

Logistics Adds Significant Customer Value

A product, or service, is of little value if it is not available to customers at the time and place that they wish to consume it. When a firm incurs the cost of moving the product toward the customer or making an inventory available in a timely manner, for the customer "value" has been created that was not there previously. It is value as surely as that created through the production of a quality product or through a low price. It is generally recognized that business creates four types of value in products or services. These are: form, time, place, and possession. Logistics creates two out of these four values.

Manufacturing creates form value as inputs are converted to outputs that are raw materials are transformed into finished goods. Logistics controls the time and place values in products, mainly through transportation, information flows, and inventories. Possession value is often considered the responsibility of marketing, engineering, and finance, where the value is created by helping customers acquire the product through such mechanisms as advertising (information), technical support, and terms of sale (pricing and credit availability). To the extent that SCM includes production, three out of the four values may be the responsibility of the logistics/supply chain manager. In addition to the four Ps in marketing(product, price, place, promotion)now added a fifth one is Pace (speed) through logistic service.

Customers Increasingly Want Quick, Customized Response

Fast food retailers, automatic teller machines, overnight package delivery, and electronic mail on the Internet have led us as consumers to expect that products and services can be made available in increasingly shorter times. In addition, improved information systems and flexible manufacturing processes have led the marketplace toward mass customization. Rather than consumers having to accept the "one size fits all" philosophy in their purchases, suppliers are increasingly offering products that meet individual customer needs.Companies too have been applying the concept of quick response to their internal operations in order to meet the service requirements of their own marketing efforts. The quick response philosophy has been used to create a marketing advantage. Saks Fifth Avenue applied it, even though big profits are made through big margins and not on cost reductions that might be achieved from good logistics management. Supply chain costs may even rise, although the advantage is to more than cover these costs through increased profits. Logistics/SC in Non-manufacturing Areas It is perhaps easiest to think of logistics/SC in terms of moving and storing a physical product in a manufacturing setting. This is too narrow a view and can lead to many missed business opportunities. The logistics/SC principles and concepts learned over the years can be applied to such areas as service industries, the military and even environment management.

Service Industry

The service sector of industrialized countries is large and growing. In the United States, over 70 percent of all jobs are in what the federal government classifies as the service sector. The size of this sector alone forces us to ask if logistics concepts are not equally applicable here as they are to the manufacturing sector. If they are, there is a tremendous untapped opportunity yet to be fulfilled.

Many companies designated as service firms in fact produce a product. Examples include: McDonald's Corporation (fast foods); Dow Jones & Co., Inc. (newspaper publishing); and Sears, Roebuck and Co. (merchandise retailing). These companies carry out all the typical supply chain activities of any manufacturing firm.

However, for service companies such as Bank One (retail banking), Marriott

Corporation (lodging) and Consolidated Edison (electric power), supply chain activities, especially those associated with physical distribution, are not as obvious. Even though many service-oriented companies may be distributing an intangible, nonphysical product, they do engage in many physical distribution activities and decisions.

A hospital may want to extend emergency medical care throughout the community and must make decisions as to the locations of the centers. United Parcel Service and Federal Express must locate terminals and route pickup and delivery trucks. The East Ohio Gas Company inventories natural gas in underground wells during the off-season in the region where demand will occur.

Bank One must locate and have cash inventory on hand for its ATMs. The Federal Reserve Bank must select the methods of transportation to move cancelled cheques among member banks.

The Catholic Church must decide the number, location, and size of the churches needed to meet shifts in size and location of congregations, as well as to plan the inventory of its pastoral staff.

Xerox's repair service for copying equipment is also a good example of the logistics decisions encountered in a service operation.

Managing logistics in service industries does represent a new direction for the future development of logistics practice.

Military

Before businesses showed much interest in co-ordinating supply chain processes, the military was well organized to carry out logistics activities. More than a decade before business logistics' developmental period, the military carried out what was called the most complex, best-planned logistics operation of that time-the invasion of Europe during World War II. Although the problems of the military, with its extremely high customer service requirements, were not identical with those of business, the similarities were great enough to provide a valuable experience base during the developmental years of logistics. For example, the military alone maintained inventories valued at about one-third of those held by all U.S. manufacturers. In addition to the management experience that such large-scale operations provide, the military sponsored, and continues to sponsor, research in the logistics area through such organizations as the RAND Corporation and the Office of Naval Research. With this background, the field of business logistics began to grow. Even the term logistics seems to have had its origins in the military. A recent example of military logistics on a large scale was the conflict between the United States and Iraq over Iraq's invasion of the small country of Kuwait. This invasion has been described as the largest military logistics operation in history. The logistics support in that war is yet another illustration of what world class companies have always known: Good logistics can be a source of competitive advantage.

Environment

Population growth and resultant economic development have heightened our awareness of environmental issues. Whether it is recycling, packaging materials, transporting hazardous materials or refurbishing products for resale, logisticians are involved in a major way. After all, the United States alone produces more than 160 million tons of waste each year; enough for a convoy of 10-ton garbage. In many cases, planning for logistics in an environmental setting is no different from that in manufacturing or service sectors. However, in a few cases additional complications arise, such as governmental regulations that make the logistics for a product more costly trucks reaching halfway to the moon. by extending the distribution channel.

Business Logistics in the Firm

It has been the tradition in many firms to organize around marketing and production functions. Normally, marketing mean selling something and production means making something. Although few business people would agree that their organization is so simple, the fact remains that many businesses emphasize these functions while treating other activities, such as traffic, purchasing, accounting, and engineering, as support areas. Such an attitude is justified to a degree, because if a firm's products cannot be produced and sold, little else matters. However, such a pattern is dangerously simple for many firms to follow in that it fails to recognize the importance of the activities that must take place between points and times of production or purchase and the points and times of demand. These are the logistics activities, and they affect the efficiency and effectiveness of both marketing and production.

The difference in operating objectives (maximize revenue versus minimize cost) for marketing and production/operations may lead to a fragmentation of interest in, and responsibility for, logistics activities, as well as a lack of co-ordination among logistics activities as a whole. This, in turn, may lead to lower customer service levels or higher total logistics costs than are necessary. Business logistics represents a regrouping, either by formal organizational structure or conceptually in the minds of management, of the movestore activities that historically may have been partially under the control of marketing and production/ operations.

NATURE AND CONCEPTS

Logistics is a recent addition in the jargon of integrated business management, formerly with the traditional fields of marketing, finance, production and per-sonnel, although it has been an integral part of these sectors since the Industrial Revolution. Business logistics, physical distribution, materials management, outbound logistics, inbound logistics, logistics management, supply chain management are only some of the terms being used to define and describe the concept of approximately the same subject—logistics, perhaps due to a rapid change in the scope and wide use of the subject matter. The term 'Logistics' stems from the Greek word 'Logisticos', meaning 'the science -of computing and calculating.' Since ancient times, logistics has been performed but earlier, it was used first within the facet of military science. In the militafysense, Webster defines Logistics as 'the procurement, maintenance and transportation of military materials, facilities and personnel' (Webster's Dictionary, 1963).

Further, a US Air Force Technical Report (1981) defines this term as 'the science of planning and carrying out the movement and maintenance of forces. In this most comprehensive sense ,logistics pertains to those aspects of military operations which deal with: (a) design and development, acquisition, storage, movement, distribution, maintenance, evacuation and disposition of materials; (b) movement, evacuation and hospitalization of personnel; (c) acquisition or construction, maintenance, operation, disposition of facilities and(d)acquisition or furnishing of services.

In 1905, Major Chauncey B. Baker wrote, 'That branch of the Art of War pertaining to the movement and supply of armies is called Logistics.'

Logistics systems and various models were used by military forces during World War II to ensure that troops and materials were made available at the_ right place to meet the country's requirements. For instance, in a book of Gulf War, it is noted on the first phase that US forces planned, moved, and served 122 million meals during the brief engagement—a task comparable to feeding all the residents of Wyoming and Vermont

three meals a day for forty days (Transport Topics,199l).
Hence, from a military point of view, logistics refers to a supportive system which reflects the practical art of moving armies and materials engaged in combats enemy to achieve the desired results.
Today, in the industrial and commercial world, logistics has acquired wider meaning. Essentially, it covers activities for the material flow from the source to the processing facilities, and subsequent distribution of finished goods from there to the ultimate users. Previously, the term physical distribution was commonly used, which refers to manufacturing and commerce to describe the broad range of activities concerned with efficient movement of finished products from the end of production line to the consumers' An early definition encompassing the total material flow involves 'a total approach to the management of all activities involved in physically acquiring, moving and storing raw materials, in-process inventory and finished goods. Inventory from the point of origin to the point of use or consumption.
In 1961, in broader sense, this same term has been defined as 'that area of business management responsible for the movement of raw materials and finished products and the development of material system.
In 1991, the Council of Logistics Management (CLM), a prestigious professional organization, modified its 1976 definition of Physical Distribution Management by first changing the term to Logistics and then changing the definition as follows:
"Logistics is the process of planning, implementing and controlling of efficient, effective flow and storage of goods, services and related information from the point of origin to the point of consumption for the purpose of conforming to customer expectations.
An engineering-oriented definition of logistics has been given by The Society of Logistics Engineers (SOLE, 1947), a professional organization, comprising about 10,000 practitioners of logistics engineering from government, the armed forces, and defencerelated cooperation, as:
The art and science of management, engineering, and technical activities concerned with the requirements, design, and supplying and maintaining the resources to support activities, plans and operations.
A more systematic definition of logistics management has been given by Bowersox and Closs (1996) as:
Logistical Management includes the design and administration of system to control the flow of materials, work-in-process, and finished inventory to support business unit strategy.
On the basis of above facet of logistics management, a more comprehensive definition of it is:
Logistics management refers to designing, developing, producing and operating an integrated system which responds to customer expectations by making available the required quantity of required quality products as and when required to offer best customer service at the least possible costs.
It is an internal integration of interrelated managerial functions to ensure a smooth flow of raw materials from the point of inception to the first production point, semi-finished goods within production process, and finished goods from the last production point to the point of consumption. Hence, a set of activities which are involved in the gamut of logistics include procurement, materials handling, storage and warehousing, protective packaging, order processing, forecasting, inventory management, transportation, and related information system. After careful analysis and review of various definitions, the major **features of logistics management may be drawn as**:
(i) It ensures a smooth flow of all types of goods such as raw materials,

work-in-process and finished goods.
(ii) It has the ability to meet customer expectations and requirements of goods.
(iii) It ensures the delivery of quality product.
(iv) It offers the best possible customer service at the least possible cost.
(v) It is an integration of various managerial functions for optimization of resources.
(vi) It deals with movement and storage of goods in appropriate quantity.
(vii) It enhances productivity and profitability.
Companies have to present best quality product at a reasonably least price as and when required, avoiding a stock-out situation which has given impetus to the concept of Logistics Management, since it has the ability to ensure a consistency in the quality, tremendous cost-saving potential and making available goods at the place of requirements in time.

BUSINESS LOGISTICS

Business logistics is a relatively new field of integrated management study in comparison with the traditional fields of finance, marketing, and production. As previously noted, logistics activities have been carried out by individuals for many years. Businesses also have continually engaged in move store (transportation-inventory) activities. The newness of the field results from the concept of co- ordinated management of the related activities, rather than the historical practice of managing them separately, and the concept that logistics adds value to products or services that are essential to customer and sales.
Although co-ordinated logistics management has not been generally practiced until recently, the idea of co-ordinated management can be traced back to at least 1844. In the writings of Jules Dupuit, a French engineer, the idea of trading one cost for another (transportation costs for inventory costs) was evident in the selection between road and water transport:
"The fact is that carriage by road being quicker, more reliable and less subject to loss or damage; it possesses advantage to which businessmen often attach a considerable value. However, it may well be that a saving induces the merchant to use a canal; he can buy warehouses and increase his floating capital in order to have a sufficient supply of goods on hand to protect himself against slowness and irregularity of the canal, and if all told the saving in transport gives him a cost advantage, he will decide in favour of the new route."
Supply chain management (SCM) is a term that has emerged in recent years that captures the essence of integrated logistics and even goes beyond it. Supply chain management emphasizes the logistics interactions that take place among the functions of marketing, logistics, and production within a firm and those interactions that take place between the legally separate firms within the product-flow channel. Opportunities for cost or customer service improvement are achieved through co-ordination and collaboration among the channel members where some essential supply chain activities may not be under the direct control of the logistician.
Definitions of the supply chain and supply chain management reflecting this broader scope are:
"The supply chain (SC) encompasses all activities associated with the flow and transformation of goods from the raw materials stage (extraction), through to the end user, as well as the associated information flows. Materials and information flow both up and down the supply chain."
"Supply chain management (SCM) is the integration of these activities, through improved supply chain relationships, to achieve a sustainable competitive advantage."
After careful study of the various definitions being offered, Mentzer and other

writers propose the broad and rather general definition as follows:
"Supply chain management is defined as the systematic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole."
It is difficult, in a practical way, to separate business logistics management from supply chain management. In so many respects, they promote the same mission:
"To get the right goods or services to the right place, at the right time, and in the desired condition, while making the greatest contribution to the firm."
Some claim that supply chain management is just another name for integrated business logistics management (IBLM) and that the broad scope of supply management has been promoted over the years. Conversely, others say that logistics is a subset of SCM, where SCM considers additional issues beyond those of product flow. For example, SCM may be concerned with product pricing and manufacturing quality.
Although SCM promotes viewing the supply channel with the broadest scope, the reality is that firms do not practise this ideal. Fawcett and Magan found that companies that do practise supply chain integration limit their scope to one tier upstream and one tier downstream.
The focus seems to be concerned with creating seamless processes within their own companies and applying new information technologies to improve the quality of information and speed of its exchange among channel members.
The boundary between the logistics and supply chain management terms is fuzzy.

OBJECTIVES OF LOGISTICS MANAGEMENT

Within the broader objectives of the firm, the business logistician seeks to achieve supply channel process goals that will move the firm toward its overall objectives. Specifically, the desire is to develop a logistics activity mix that will result in the highest possible return on investment over time.
There are two dimensions to this goal:
(1) The impact of the logistics system design on the revenue contribution.
(2) The operating cost and capital requirements of the design.
Ideally, the logistician should know how much additional revenue would be generated through incremental improvements in the quality of customer service provided. However, such revenue is not generally known with great accuracy. Often, the customer service level is set at a target value, usually one that is acceptable to customers, the sales function, or other concerned parties. At this point, the logistics objective may become one of minimizing costs subject to meeting the desired service level rather than profit maximization or return on investment. Unlike revenue, logistics costs usually can be determined as accurately as accounting practice will allow and are generally of two types: operating costs and capital costs.
Operating costs are those that recur periodically or those that vary directly with variation in activity levels. Wages, public warehousing expenses, and administrative and certain other overhead expenses are examples of operating costs.
Capital costs are the one-time expenses that do not change with normal variations in activity levels. Examples here are the investment in a private trucking fleet, the construction cost of a company warehouse, and the purchase of materials-handling equipment. If it is assumed that there is knowledge of the effect of logistics activity levels on revenues of the firm, a workable financial objective for logistics can be expressed in the ratio known as

ROLA (return on logistics assets).
ROLA is defined as:
Logistics assets
The contribution to revenue refers to the sales resulting from the logistics system design. Logistics operating costs are the expenses incurred to provide the level of logistics customer service needed to generate sales. Logistics assets are the capital investments made in the logistics system. ROLA is to be maximized over time.
If the value of money is high, maximizing the present value of cash flows or maximizing the internal rate of return is a more appropriate statement of the objective. Maximizing the cumulative return on investment over time is the single most important objective to ensure the long-run survival of the firm.
Operational objective of logistical management:
1. Right response
2. Right quality
3. Right quantity
4. Right value
5. Right cost trade-offs
6. Right information

ELEMENTS OF LIGISTICS MANAGEMENT

Logistics management consists of eight elements called wings of logistics. These are discussed in a nutshell below.

1. Customer Order Processing

Flow of Actions
1. Filling up the order form
2. Deciding the specifications of the product
3. Deciding the quality check list of the product
4. Deciding the delivery schedule
5. Deciding the location of delivery

Important Factors
1. Cost of order processing
2. Whether the company is capable of producing a component
3. Detailed list of specifications

Techniques
1. Electronic data Interchange (EDI)
2. E-ERP or CPFR
3. Web

2. Location Analysis

Flow of Actions
1. Cost of transportation of raw materials and finished goods
- Proximity to suppliers
- Proximity to customers

2. Availability and type of land
3. Availability of secondary resources
4. Availability of desired manpower at affordable cost
5. Communal harmony
6. Governmental regulation and taxation

Important Factors
1. Cost of operations as a percentage of sales

2. Shelf life of product

3. Inventory Control

Flow of Actions

1. on hand inventory analysis
2. Communicating the quantity, quality and timing of material with the supply points.
3. Getting the material of right quality, quantity and at right time

Important Factors

1. Inventory control at planning stage
2. Lead time
3. Cost vs. importance of raw material

Techniques

1. DRP and replenishment order control
2. Fixed order interval system
3. Economic order quantity with ROP system
4. Selective inventory control (ABC, VED, FSN analysis etc.)
5. Order forecasting using statistical tools

4. Material Handling

Flow of Actions

1. Type of material (Business significance like raw material, finished goods etc.)
2. Material handling requirements of the material (Fragile, inflammable)
3. Cost ratio of material handling to material cost.
4. Material default location, identification and traceability

Important Factors

1. Material breakage
2. Pilferage
3. Cost of material handling
4. Number of handlings

Techniques

1. Operational research
2. Material flow analysis
3. Computerized material retrieval system
4. ASRS (Advanced Storage & Retrieval System)

5. Packaging

Flow of Actions

1. Packaging requirement for the material (Refrigeration, Fragile etc.)
2. Primary packaging
3. Secondary packaging
4. Cost of packaging
5. Transportation requirement for packaging (Vibration proof, water or moisture tight)

Important Factors

1. Protection to product
2. Holding the product
3. Communicating the message to customers
4. Customer requirement for packaging
5. Reverse logistics for packaging
6. Recycling of packaging material
7. Cost of packaging

Techniques

1. Standardized box packaging
2. Containerization of packaging

3. Direct part marking
4. ISO 14001
5. Recycling of packaging materials
6. Reusable packaging materials
7. Eco-friendly packaging materials
8. Bar coding
9. Bumpy bar coding
10. GPS tracking system
11. RFID

6. Transportation

Flow of Actions
1. Mode of transportation
2. Cost of product
3. Speed of transportation
4. Ambience requirement of material (Refrigeration, Vacuum)
5. Cost of transportation
6. Urgency of the product to customers

Important Factors
1. Urgency of the product
2. Cost of product
3. Cost of transportation

Techniques
1. Containerized transportation
2. Cool Chain Transport (Refrigerated Vans/Containers)
3. Multi-modal Logistics
4. Milk Run Distribution systems
5. Cross Docking
6. Direct Shipment

7. Warehousing

Flow of Actions
1. Location of the warehouse
2. Inventory level at the warehouse
3. Storage requirement of the product
4. Packaging and repackaging requirement of the product
5. Shelf life of the product

Important Factors
1. Availability of space
2. Availability of proper material handling systems
3. Strategic location
4. Packing and Re-packing facilities
5. Information and allied services

Techniques
1. Third Party Logistics
2. Third party warehousing

8. Customer Service

Flow of Actions
1. Contractual services offered to client
2. Type of customer service required for the product
3. Location of the service centre
4. Service level at the service centre

5. Cost of service vs. replacement
Important Factors
1. Contractual requirement of customer service
2. Service quality
3. Reverse logistics
Techniques
1. AMC (Annual Maintenance Contracts) and free replacements
2. Limited (free) trial period
3. Guarantee & warrantee
4. User clubs
5. Help lines, toll free number, call centers
6. CRM

MODULE 3

TOTAL QUALITY MANAGEMENT

INTRODUCTION

Our globalized economy is dominated by three Cs – Competition, Change and Complexity. The best way to meet the challenge of the three Cs is to focus on our customers. Once it is accepted that success begins and ends with the customer, we find ourselves on to the path to Total Quality Management (TQM).

MEANING AND DEFINITION OF QUALITY

Quality is consistent conformance to customer expectations.

This means that when customer needs and wants change we have to change to accommodate those needs, or we will no longer be delivering quality.

Total quality is the perfect control over all technical and business processes.

We never achieve total quality. However, this is the goal for companies that practice lean manufacturing. Some people use the lean mterm lean thinking when lean manufacturing techniques are used by non-manufacturing companies; but it is the same thing.

The dictionary has many definitions of “quality”. A short definition that has achieved acceptance is: “Quality is Customer Satisfaction”. “Fitness for use” is an alternative short definition. Here, customer means anyone who is impacted by the product or process.

Quality is “a predictable degree of uniformity and dependability, at low cost and suited to the market”.

Quality is a relative term, generally used with reference to the end-use of a product. Quality should be aimed at the needs of the consumer, present and future.

According to ISO 8402, quality is “the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs

Broadly quality is:

a) Fitness for use

b) Grade

c) Degree of preference

d) Degree of excellence

e) Conformity to requirements

Dimensions of Quality: The following are the components reveal the dimensions of quality.

Manufacturing and Service Industries

Product Features Accuracy

Performance Timeliness

Reliability Completeness

Durability Friendliness and courtesy

Ease of use Anticipating customer needs

Serviceability Knowledge of server

Aesthetics

Availability Reputation

Reputation

Quality Planning: Quality planning is the pre determined activities in order to achieve conformation to the requirements. Many organizations are finding that strategic quality plans and business plans are inseparable. The quality planning procedure given by Joseph. A. Juran has the following steps:

· Identify the customers

· Determine their needs

· Translate those needs into our language.

· Develop a product that can respond to those needs

· Optimize the product features to meet our and customer needs

Quality Costs : All organizations make use of the concept of identifying the costs needed to carry out the various functions – product development, marketing, personnel, production etc.,

Until the 1950's this cost concept had not been extended to quality function, except for the departmental activities of inspection and testing.

During the 1950's the concept of "Quality Cost" emerged. Different people assigned different meanings to the term. Some people equated quality cost with the cost of attaining quality; some people equated the term with the extra incurred due to poor quality. But, widely accepted thing is "Quality cost is the extra cost incurred due to poor or bad quality of the product or service".

Categories of Quality Cost: Many companies summarize quality costs into four broad categories. They are (a) internal failure costs - The cost associated with defects that are found prior to transfer of the product to the customer.

b) External failure costs - The cost associated with defects that are found after product is shipped to the customer.

c) Appraisal costs - The cost incurred in determining the degree of conformance to quality requirement.

d) Prevention costs - The cost incurred in keeping failure and appraisal costs to a minimum.

We can also include the hidden costs ie., implicit costs.

But higher quality doesn't mean higher costs. The companies estimate quality costs for the following reasons:

a) To quantifying the size of the quality problem in the language of money improves communication between middle managers and upper managers.

b) To identify major opportunities for cost reduction.

c) To identify the opportunities for reducing customer dissatisfaction and associated threats to product saleability.

QUALITY EDUCATION

Quality education: - Many definitions of quality in education exist, testifying to the complexity and multifaceted nature of the concept. The terms efficiency, effectiveness, equity and quality have often been used synonymously
(Adams, 1993). Considerable consensus exists around the basic dimensions of quality education today, however.

Quality education includes:

1. Learners who are healthy, well-nourished and ready to participate and learn, and supported in learning by their families and communities;
2. Environments that are healthy, safe, protective and gender-sensitive, and provide adequate resources and facilities;
3. Content that is reflected in relevant curricula and materials for the acquisition of basic skills, especially in the areas of literacy, numeracy and skills for life, and knowledge in such areas as gender, health, nutrition, HIV/AIDS prevention and peace;
4. Processes through which trained teachers use child-centred teaching approaches in well-managed classrooms and schools and skilful assessment to facilitate learning and reduce disparities
5. Outcomes that encompass knowledge, skills and attitudes, and are linked to national goals for education and positive participation in society.

This definition allows for an understanding of education as a complex system embedded in a political, cultural and economic context. This paper will examine research related to these dimensions. It is important to keep in mind education's systemic nature, however; these dimensions are interdependent, influencing each other in ways that are

sometimes unforeseeable.

This definition also takes into account the global and international influences that propel the discussion of educational quality (Motala, 2000; Pipho, 2000), while ensuring that national and local educational contexts contribute to definitions of quality in varying countries (Adams, 1993). Establishing a contextualized understanding of quality means including relevant stakeholders. Key stakeholders often hold different views and meanings of educational quality. Indeed, each of us judges the school system in terms of the final goals we set for our children our community, our country and ourselves.

Definitions of quality must be open to change and evolution based on information, changing contexts, and new understandings of the nature of education's challenges. New research — ranging from multinational research to action research at the classroom level— contributes to this redefinition.

Systems that embrace change through data generation, use and self-assessment are more likely to offer quality education to students. Continuous assessment and improvement can focus on any or all dimensions of system quality: learners, learning environments, content, process and outcomes.

EFFICIENCY V/S EFFECTIVENESS

The difference between efficient and effective is that efficiency refers to how well you do something, whereas effectiveness refers to how useful it is.

For example, if a company is not doing well and they decide to train their workforce on a new technology. The training goes really well - they train all their employees in record time and tests show they have absorbed the training well. But overall productivity doesn't improve. In this case the company's strategy was efficient but not effective. Quality management includes both aspects. The following chart shows the comparative importance of efficiency and effectiveness in quality management.

Effectiveness Efficiency

Meaning:

Effectiveness is about doing the right task, completing activities and achieving goals. Efficiency is about doing things in an optimalway, for example doing it the fastest or in theleast expensive way. It could be the wrong thing, but it was done optimally.

QUALITY MANAGEMENT

Quality management is the process of identifying and administering the activities needed to achieve the quality objectives of an organisation.

INTERNAL AND EXTERNAL CUSTOMERS

A customer is anyone who needs our help - in any, whichever, way.orA customer is anyone we are trying to help.

There are two types of customers – external and internal:

1. External customers are outside the organization. They need our help with information, purchase, and use of the product. Suppliers also are customers because they need information and other inputs.

2. Internal customers include everyone in the organization. Everyone in the organization plays three roles: supplier, processor and customer. Each person receives something from someone (as a customer), does something with it (as a processor) and passes it to a third individual (as a supplier).

It is necessary to satisfy all the needs of internal customers and keep them happy.

This has a big impact on how well they serve external customers. We have to very strongly focus on our external customers - users and suppliers. There are at least six good reasons for doing so:

1. The customer decides the worth of a product and service (henceforth collectively called 'product'). She decides whether the value of the product is worth its price.

Value is a subjective measure of the benefits vis-à-vis cost of the product.

2. If the customer feels that the product has poor value she may not buy it. We cannot let this happen.

3. Customer focus helps us understand her needs and wants. By giving her exactly what she wants we ensure very good value for our offering. We win against competition

only by offering superior value.

4. Focus on capturing the "voice of the customer". To deliver superior value, a product should be conceived, developed and delivered as per customer expectations

5. When a product meets all customer expectations, it has Good Quality. Without customer focus there is little chance that we can deliver superior products.

6. Customer focus is necessary because a one-size-fits-all solution is unacceptable. It just does not deliver full value. This is why firms differentiate the market and concentrate on serving customers who belong to a specific segment.

QUALITY STATEMENTS: VISION STATEMENT AND MISSION STATEMENT.

Core values and concepts provide the unity of purpose. In addition to that, the quality statements include the vision statement, mission statement and quality policy statement. They are the part of the strategic planning process.

Vision Statement: It is a short declaration of what an organization aspires to be tomorrow. It is the ideal state that might never reach but which you continuously strive to achieve.

Example: We will be the preferred provider of safe, reliable, and cost-effective products and services that satisfy the electric-related needs of all customer segments.

FLORIDA POWER & LIGHT COMPANY

Mission Statement: The mission statements answers the following questions :

Who we are? Who are the customers? What we do? And How we do it ?

It is the usually a one paragraph statement which describes the function of the organization. It provides a clear statement of purpose for employees, customers and suppliers.

Example: To meet customers' transportation and distribution needs by being the best at moving their goods on time, safely and damage free.

CANADIAN NATIONAL RAILWAYS

OBJECTIVES OF QUALITY MANAGEMENT

The objective of quality management is to provide products which are dependable,

satisfactory and economical.

PRINCIPLES OF QUALITY MANAGEMENT

The principles are derived from the collective experience and knowledge of the international experts who participate in ISO Technical Committee ISO/TC 176, Quality management and quality assurance, which is responsible for developing and maintaining the ISO 9000 standards. The eight quality management principles are defined in ISO 9000:2005, Quality management systems – Fundamentals and vocabulary, and in ISO 9004:2009, Managing for the sustained success of an organization –A quality management approach.

Principle 1 – Customer focus

Principle 2 – Leadership

Principle 3 – Involvement of people

Principle 4 – Process approach

Principle 5 – System approach to

Principle 6 – Continual improvement

Principle 7 – Factual approach to decision making

Principle 8 – Mutually beneficial supplier relationships

Principle 1 – Customer focus

Organizations depend on their customers and therefore should understand current and future customer needs, should meet customer requirements and strive to exceed customer expectations.

• Increased revenue and market share obtained through flexible and fast responses to market opportunities

• Increased effectiveness in the use of the organization's resources to enhance customer satisfaction

• Improved customer loyalty leading to repeat business.

• Researching and understanding customer needs and expectations

• Ensuring that the objectives of the organization are linked to customer needs and expectations

• Communicating customer needs and expectations throughout the organization

• Measuring customer satisfaction and acting on the results

• Systematically managing customer relationships

• Ensuring a balanced approach between satisfying customers and other interested parties (such as owners, employees, suppliers, financiers, local communities and society as a whole).

Principle 2 – Leadership

Leaders establish unity of purpose and direction of the organization. They should create and maintain the internal environment in which people can become fully involved in achieving the organization's objectives.

• People will understand and be motivated towards the organization's goals and objectives

• Activities are evaluated, aligned and implemented in a unified way

• Miscommunication between levels of an organization will be minimized.

• Considering the needs of all interested parties including customers, owners, employees, suppliers, financiers, local communities and society as a whole

• Establishing a clear vision of the organization's future

• Setting challenging goals and targets

• Creating and sustaining shared values, fairness and ethical role models at all levels of the organization

• Establishing trust and eliminating fear

• Providing people with the required resources, training and freedom to act with responsibility and accountability

• Inspiring, encouraging and recognizing people's contributions.

Principle 3 – Involvement of people at all levels are the essence of an organization and

their full involvement enables their abilities to be used for the organization's benefit.

• Motivated, committed and involved people within the organization

• Innovation and creativity in furthering the organization's objectives

• People being accountable for their own performance

• People eager to participate in and contribute to continual improvement.

• People understanding the importance of their contribution and role in the organization

• People identifying constraints to their performance

• People accepting ownership of problems and their responsibility for solving them

• People evaluating their performance against their personal goals and objectives

• People actively seeking opportunities to enhance their competence, knowledge and experience

• People freely sharing knowledge and experience

• People openly discussing problems and issues.

Principle 4 – Process approach

A desired result is achieved more efficiently when activities and related resources are managed as a process.

• Lower costs and shorter cycle times through effective use of resources

• Improved, consistent and predictable results

• Focused and prioritized improvement opportunities.

• Systematically defining the activities necessary to obtain a desired result

• Establishing clear responsibility and accountability for managing key activities

• Analysing and measuring of the capability of key activities

• Identifying the interfaces of key activities within and between the functions of the organization

• Focusing on the factors – such as resources, methods, and materials – that will improve key activities of the organization

• Evaluating risks, consequences and impacts of activities on customers, suppliers and other interested parties.

Principle 5 – System approach to management

Identifying, understanding and managing interrelated processes as a system contributes to the organization's effectiveness and efficiency in achieving its objectives.

• Ability to focus effort on the key processes

• Providing confidence to interested parties as to the consistency, effectiveness and efficiency of the organization.

• Structuring a system to achieve the organization's objectives in the most effective and efficient way

• Understanding the interdependencies between the processes of the system

• Structured approaches that harmonize and integrate processes

• Providing a better understanding of the roles and responsibilities necessary for achieving common objectives and thereby reducing cross-functional barriers

• Understanding organizational capabilities and establishing resource constraints prior to action

• Targeting and defining how specific activities within a system should operate

• Continually improving the system through measurement and evaluation.

Principle 6 – Continual improvement

Continual improvement of the organization's overall performance should be a permanent objective of the organization.

• Performance advantage through improved organizational capabilities

• Alignment of improvement activities at all levels to an organization's strategic intent

• Flexibility to react quickly to opportunities.

• Employing a consistent organization-wide approach to continual improvement of the organization's performance

• Providing people with training in the methods and tools of continual improvement

• Making continual improvement of products, processes and systems an objective for every individual in the organization

• Establishing goals to guide, and measures to track, continual improvement

• Recognizing and acknowledging improvements.

Principle 7 – Factual approach to decision making

Effective decisions are based on the analysis of data and information

• Informed decisions

• An increased ability to demonstrate the effectiveness of past decisions through reference to factual records

• Increased ability to review, challenge and change opinions and decisions.

• Ensuring that data and information are sufficiently accurate and

• Making data accessible to those who need it

• Analysing data and information using valid methods

• Making decisions and taking action based on factual analysis, balanced with experience and intuition.

Principle 8 – Mutually beneficial supplier relationships

An organization and its suppliers are interdependent and a mutually beneficial relationship enhances the ability of both to create value

• Increased ability to create value for both parties

• Flexibility and speed of joint responses to changing market or customer needs and expectations

• Optimization of costs and resources.

• Establishing relationships that balance short-term gains with long-term considerations

• Pooling of expertise and resources with partners

• Identifying and selecting key suppliers

• Clear and open communication

• Sharing information and future plans

• Establishing joint development and improvement activities

• Inspiring, encouraging and recognizing improvements and achievements by suppliers.