**Supply Chain**

· A supply chain is a system of organizations, people, technology, activities, information and resources involved in moving a product or service from supplier to customer.

· Supply chain activities transform natural resources, raw materials and components into a finished product that is delivered to the end customer.

· In sophisticated supply chain systems, used products may re-enter the supply chain at any point where residual value is recyclable.

**Supply Chain Management(SCM)**

· Supply Chain Management is the oversight of materials, information & finances as they move in a process from supplier to manufacturer to wholesaler to retailer to consumer.

· SCM involves coordinating & integrating these flows both within & among companies.

· SCM enables collaboration, planning, execution & coordination of the entire supply chain, empowering companies to adopt their supply chain processes to an ever changing competitive environment.

· With better synchronization across the entire supply chain, the business partners achieve the following major benefits:-

Ø Lower Inventories & therefore lower financing costs

Ø Shorter receivable cycles

Ø Optimal use of production resources & costly workforces

Ø Faster response to market changes

Ø Greater satisfaction & loyalty among customers

Ø Greater profitability

· The military was one of the first organizations to recognize supply chains & to manage them during World War II.

· The SCM systems have become more efficient & intelligent with the use of computers, artificial intelligence & other advancements in the field of information technology.

· SCM solution transform traditional supply chains from linear, sequential steps into an adaptive supply chain network in which communities of customer-centric, demand driven companies share knowledge, intelligently adapt to changing market conditions & proactively respond to shorter, less predictable life cycles.

· Today almost all organizations-military, manufacturing, service industries, retailers & so on use SCM systems to improve their efficiency & effectiveness.

**Advantages of Supply Chain Management**

« Supply Chain Planning & Collaboration: Supply chain planning functionality enables you to maximize return on assets & ensures a profitable match of supply & demand.

« Supply Chain Execution: SCM enables you to carry out supply chain planning & generate high efficiency at the lowest possible cost.

« Supply Chain Visibility Design & Analytics: SCM gives you network-wide visibility across your extended supply chain to perform strategic as well as day-to-day planning.

« Business Benefits: SCM can help you transform linear supply chain into an adaptive network with the following benefits:-

§ Faster response to changes in supply & demand.

§ Increased customer satisfaction.

§ Compliance with regulatory requirements

§ Improved Cash flow

§ High margins

§ Greater synchronization with business priorities

**Just In Time (JIT)**

· JIT means to produce goods and services when needed, not too early and not too late. It is time based and often has quality and efficiency targets.

· It is a Japanese production management philosophy since 1970s, which allows having the right items of the right quantity & quality, in the right place and at right time. This is hand to mouth approach to production. The primary goal of JIT is to achieve zero inventories within the organization as well as throughout the entire supply chain.

· The JIT system uses the PULL method of scheduling material flow.

· A JIT system aims to make goods available just-in-time, and these cab be parts, products or sub-assemblies and achieve some of the following benefits:-

§ Increased Flexibility

§ Parts Reduction

§ Increased Quality

§ Simplicity of System

**To achieve the aims of JIT a disciplined approach is needed which incorporates three principles applied to the organization:-**

Ø Elimination of Waste

Ø Total Quality Management

Ø Total Employee Involvement

**Elimination of Waste:** Waste elimination is basically removal of any activity that is not value-added, but first it has to be identified. These activities don’t increase product value and are costly to the company. Examples of non-value added activities include traditional production methods, i.e, inspection of parts, holding stock inventories, time etc.

Waste can be eliminated from these activities by removal of defects and by not over producing hence, make-to-order.

**Total Quality Management:** TQM eliminates waste by eliminating defects. In a JIT environment, the aim is to prevent defects from occurring and this is achieved by detecting problems at their source. The whole organization is involved in the process, right from the stages of manufacturing, product development and purchasing. Manufacturing uses statistical process control (SPC) and in-process testing (to allow detection at source), while product development ensures that new products can be manufactured to specification. Purchasing makes sure that the parts that are bought are of required quality.

**Total Employee Involvement:** Total employee involvement has management providing the leadership which result in employees wanting to be involved in the processes. Opportunity is provided through education & training & work teams.

Benefits of JIT

® **Increased Flexibility:** A flexible workforce means that the operators must be multi-skilled which is done through training. The worker should be free to move from low demand to high demand areas.

® **Parts reduction:** JIT continuously seeks to reduce inventory levels of raw materials, work in progress and finished goods. Lower inventory means less space & less chance of the product being obsolete, damaged or spoiled.

® **Increased Quality:** When operating a JIT system, disruption has a major impact, so quality problems need to be eliminated. Benchmarking Quality Function Deployment and service design can be used for service operations. Since employees need to learn the value of providing defect free services.

® **Simplicity of System**: Product mix or volume changes as planned by the Master Production Schedule (MPS) can be accomplished by adjusting the no. of cards in the system. Production orders are prioritized by the cards on a post. Production orders for parts that are running low are moved in front of parts that have more supply.

Potential Pitfalls of JIT

® Many companies fail to understand what JIT is and what it can mean to them because they fail to implement it properly. Most importantly, they need to be aware of the tasks, resources, time scale and costs. For this, the system will need the full backing of the top management.

® The JIT will also fail, if an adequate education programme is not provided. If careful planning of process & control improvements are not strictly followed, they will result in JIT not been realized. The planning stage will require dedication & time and may also require the assistance of an external consultant(s).

**PUSH & PULL System of Production**

The term PUSH and PULL are used to describe two different systems for moving work through a production process.

In traditional environments, a PUSH system is used. When work is finished at a work station, the output is pushed to the next station or in the case of final production it is pushed on to the final inventory.

Conversely, in a PULL system-each work station pulls the output from the preceding station as it is needed; the output of final operation is pulled by the customer demand or the master schedule. Thus in a PULL system, work moves on in response to demand from the next stage in the process, whereas in a PUSH system, work moves on as it is completed without regard to the next station’s readiness for the work. Consequently work may pile up at workstations that fall behind schedule because failure or the detection of a problem of quality.

**Built-To-Order (BTO)**

· Built-to-order and sometimes referred to as make-to-order (MTO), is a production approach where products are not built until a confirmed order for products is received.

· This approach is considered good for highly configured products e.g. bicycles, computer servers, or for products where holding inventories is very expensive e.g. aircraft