

## A Review on Just in Time system in the context of production line in an industry

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**Abstract** : APICS (American Production and Inventory Control Society) defined JIT as “a philosophy of manufacturing based on planned elimination of all waste and on continuous



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improvement of productivity”. It has also been described as an approach with the objective of producing the right part at the right place at the right time and at minimum possible cost. JIT is a demand pull system. In short, JIT attempts to accurately match demand with supply. Products are steadily flown through the system from the supplier to the final output without slack.

JIT has also been defined as a driver that establishes regular, frequent deliveries in small lots from a distributor, and which reduces inventory from a thirty days or sixty days to ten days supply and if possible then reduces to hourly supply.

A simple definition of JIT is to produce and deliver finished goods just in time to be sold, subassemblies just in time to be assembled into finished goods, fabricate parts just in time to go into subassemblies, and purchase parts just in time to be transferred in to fabricated parts.

JIT is observed as a near perfect situation achieved by continuous elimination of the wastes. JIT has been viewed as a strategic weapon for productivity improvement by making all processes streamlined, efficient and effective and quality oriented in an order to enhance the responsiveness of the firm towards customer needs.

**Key Words** : JIT, Manufacturing Process, Production, waste, TQM. TPM

**History of JIT:** JIT is a Japanese manufacturing management method developed in 1970s. It was first adopted by Toyota manufacturing plants by Taiichi Ohno. The main concern at that time was to meet consumer demands. Because of the success of JIT management, Taiichi Ohno was named the Father of JIT. After the first introduction of JIT by Toyota, many companies followed up and around mid-1970s', it gained extended support and widely used by many companies. One motivated reason for developing JIT and some other better production techniques was that people had a very strong incentive

to develop a good manufacturing technique to rebuild their economy. In Japan, JIT manufacturing is referred as the Toyota Production System. The realization for the new system came after World War II when the Japanese automotive manufactures knew they were far behind the American motor companies.

### Philosophy of JIT:

The first basic principle involved in JIT production approach is the Flexible Workforce. In a JIT system, waste is defined as anything associated with the production process that does not add value



to the product. Thus, waste includes quality defects, inventories of all kinds, time spent to move material and time spent in setting up the machines. If the implications of managing the reduction in waste for the categories mentioned above are analyzed, it becomes obvious why JIT is involved in all aspects of the management of production Process. The second principle of JIT involves the management of people.

The production worker is also given the responsibility for the maintenance of his equipment. Frequently, a production worker goes through a check list before starting to operate the equipment similar to that done by a Pilot before Flying an Aircraft. Along with the new job responsibility for workers comes the responsibility for management to provide the training, time, tools and most important, the authority necessary to accomplish the job.

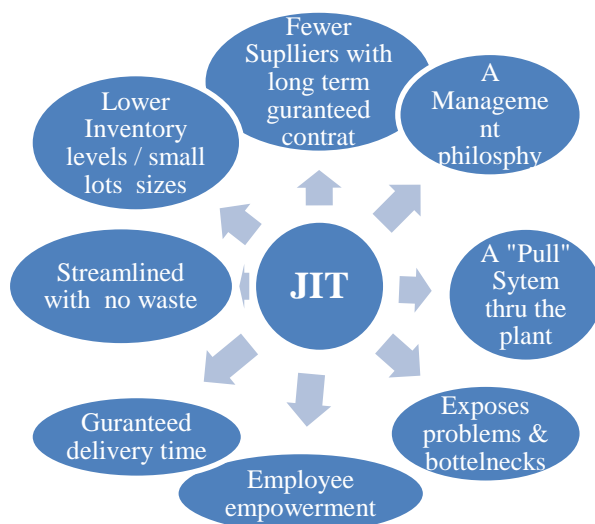


Fig 1 Philosophy of JIT

### Basic Elements of JIT

The elements of JIT, when applied to manufacturing system, ensure that parts or

raw materials arrive on the factory floor only at the point of required use or when they are actually needed. Not only does this help with inventory control and costs, but also with inventory storage concerns. Ideally, JIT also ensures that the finished product is only achieved when it is required by the end user or customer. If such JIT methods are properly implemented, the vast savings in inventory can translate to lower costs and benefit the customer as well as the manufacturer. Following are the basic elements of JIT.

1. Flexible Resources
2. Cellular Layouts
3. Kanban System
4. Small-Lot Production
5. Quick Setups
6. Standardization
7. Jidoka
8. Total Quality Management
9. Total Productive Maintenance
10. Life Time Employment.

### Types Of Wastes

Waste elimination is one of the most effective ways to increase profitability in manufacturing and distribution businesses. In order to eliminate waste, it is important to understand exactly what waste is. The eight types of wastes generally found in an Industry are overproduction, waiting time, transportation, inventory, processing, motion and product defect.

### Objectives Of JIT

The prime goal of JIT is achievement of zero inventories, not just within the confine of a single organization, but



ultimately throughout the entire supply chain. Following are the main objective of JIT:

- Zero Inventory
- Zero Failures
- Zero Lead Time
- Elimination of Wastes
- Smooth Flow Process
- Increased Return on Investment (ROI)

### Advantages Of Just-In-Time System:

The advantages of using JIT are numerous. Several advantages mentioned already are those of waste reduction and increased ability to remain competitive. Following are the other advantages of Adopting Just-In-Time Manufacturing Systems:

- Just-in-time manufacturing keeps stock holding costs to a bare minimum. The release of storage space results in better utilization of space and thereby bears a favorable impact on the rent paid and on any insurance premiums that would otherwise need to be made.
- Just-in-time manufacturing eliminates waste, as out-of-date or expired products; do not enter into this equation at all.
- Just-in-time manufacturing encourages the 'right first time' concept, so that inspection costs and cost of rework is minimized.
- High quality products and greater efficiency can be derived from following a just-in-time production system.
- Close relationships are fostered along the production chain under a just-in-time manufacturing system.

### Literature Review

There was much interest in American industries in the use of just-in-time (JIT) manufacturing to reduce the work-in-progress (WIP) inventory and to increase the quality of the end product. However, while it promised significant results, it might be difficult to justify that management discard an operating MRP system in favor of a philosophy.

JIT is not just a way to reduce inventory but it is a mean of solving problems that block the building of an excellent manufacturing organization. Its applications and benefits apply not only to the shop floor but also to the marketing, purchasing and accounting aspects. But benefits from this system cannot be achieved overnight. It is a slow process and takes 5 to 10 years to obtain optimum results.

A fundamental microeconomic analysis of a firm which had made an investment into just-in-time (JIT) manufacturing principles was performed. The firm was assumed to possess some monopoly power in the purchasing of its raw materials and had sold its output in a competitive market. The firm's investment process could take place over one or more time periods and it was assumed that, properly implemented, JIT brings about a unit production cost reduction.

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