
JIT Implementation: Concepts, Benefit and Obstructions in Indian Industries

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Abstract:

Just-in Time system has been defined and identified worldwide by many researchers and practitioners for world class manufacturing. In today's competitive world shorten product life cycles, customer's rapid demands and quickly changing business environment is putting lot of pressures on original equipment manufacturers (OEM). This system has been accepted as a systematic approach to achieve competitiveness and excellence in manufacturing by many researchers and practitioners in many countries in last three decades. This system has potential to compete in the present scenario of rapid development and growth of industrialization. This paper presents the spread of JIT movement, concepts, benefits, implementation and obstructions of JIT system.

Keywords: JIT, Manufacturing, Implementation phases, Benefit, Obstructions

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1. Introduction:

The new technologies have far reaching implications for the competitive advantages of countries in the international competition of global markets. The most fortunate thing about the new industrial revolution is that skilled people and not much by heavy machinery largely dominate it. Modern technology is more oriented towards system configuration than the development of hard and robust machines. With the development of fast communication, rapid transportation and super computers, manufacturing is no longer restricted today at local level, but has become global in character. A manufacturing company has to become competitive for its survival; it has to supply products of consistent high quality at reliable and reduced delivery time.

JIT may be described as an extension of the original concept of managing the material flow in a factory to reduce the inventory levels [7]. In fact, there is much more involved in a manufacturing organization than reducing inventories to control costs. Manufacturing has to deal with other issues, such as process control, level of automation, engineering support, and the quality of product delivered to customers. . JIT (Just-in-Time) is one such approach to become a world-class competitor for world-class manufacturing. During the last two decades, the purchasing environment has become one of the most crucial elements in establishing the value added contents for the products and services and hence has become the vital organization in the

dynamic international market [1]. Shortages of raw material, shorter lead time, high quality, increasing the variety of products with smaller runs, inflation, productivity and introduction of a JIT purchasing system etc. has prompted the realization of the importance of purchasing. The traditional approach to purchasing is at the root of many of the problems, business faces today. High inventory levels, soaring costs, adverse relationships with suppliers and quality issues which either stop production or results in poor products are just a few of the problems with the current way of purchasing [2].

2. Concept:

The philosophy of Japanese manufacturing industries like TOYOTA is to 'sell one-make one' (SOMO) which emphasis on lean manufacturing. In Indian manufacturing industries emphasis is on the sophisticated Machines and high grade materials, which are expensive, yet quality is not up to the mark. In Japan emphasis is on developing men and technology to utilize available resources; quality is high but cost is commensurate. "Technology is never really the problem; the problem is how to use technology effectively". All these statements made by experts and representatives of different companies high light and support the concept of JIT [24]. JIT leads to significantly higher quality and productivity and provides visibility for results so that worker's responsibility and commitment are improved. JIT may be described as an extension of the original concept of managing the material flow in industries to reduce the inventory levels at each stage .It is a demand driven approach, which encourages flow type production. It is also described as a drive to simplify the manufacturing system in order to quickly detect the problems and their immediate solutions. It is now well recognized that JIT is not just an arrangement of techniques but really a philosophy. The central idea behind the JIT philosophy is to expose the hidden problems and involve all employees, to remove them, so that the necessity of higher stocks does not arise. The techniques and systems used by various companies under waste elimination techniques of JIT are as follows:

- Batch size reduction.
- Group technology layout.
- Scientific machine and factory design.
- Mixed model of production.
- Kanban applications.
- Balanced scheduling.
- Set-up time reduction.
- Flexible and multi-functional workforce.
- Vendors orientation to JIT manufacturing.

"JIT is not just a series of techniques rather it is a manufacturing philosophy which requires the support commitment and participation of human resources at all levels of organization." Garg et al. [11]: "JIT is a philosophy that defines the way the work should be done. It is concerned with creating the right environment for effective operation. They further stated that JIT is best defined as an approach to achieve excellence in a manufacturing company." Baker [3]: "Just in time system is an approach for providing smoother production flows and making continuous improvements in processes and products." Billesbach [5]: "JIT is a philosophy that extends throughout the entire organization, and one, which emphasizes a proactive approach to the management of operations." Moore [18]: JIT can be summarized as a system to eliminate waste

and achieve excellence in an entire organization. The sole purpose of JIT is to eliminate waste. Anything that does not add any value to the product is known as waste.

3. JIT in Indian Manufacturing Industries:

Garg et al. [8] stated that JIT require a culture that permits the worker to join in decision making and thus necessitates putting trust and responsibility in the hands of workers and supplier to become same interest group by the way of having long term relationship . In JIT culture some changes will require like as top management commitment, involvement and leadership, labor participation in decision making and skilled education and training to the concerned person's. Singhvi [26] stated that it is impossible to implement JIT without employee involvement and persistent focus on quality. The experience of an Indian automobile company in implementing JIT, some quality improvements like improvements in equality level, reduction in work in process, reduction in space and reduction in material handling. The study found that 'employee involvement' is a critical element for implementing the JIT. Vrat et al. [28] stated that difficulty of JIT implementation in Indian context indicates that quality circles and good communication are not very difficult to implement while other elements like multifunctional workers, long term relationship with vendor, support from labour union and top management attitude have high rating, which indicates that JIT implementation in India is slightly difficult, but not impossible. Padukone and Subba rao [22] stated that if JIT philosophy's implemented in Indian manufacturing sector then India may be provide an excellent case study to determine. But JIT implementation without understanding the conceptual framework cannot result in long lasting improvements. This study suggested that JIT should be implemented in two stages. First stage of JIT implementation includes set up reduction, lot size reduction, small machines, quality, layout, buffer stock reduction and flexible work force. Ajit Singh [25] stated that JIT and TQC offer the complimentary means of reaching quality objective. JIT removes the buffer of inventory by traditional stocking methods and expose the quality problem at earlier stages. TQC detects the pattern and exact locations of quality problems. The concerned person's needed to be trained to perform the preventive and maintenance activities so that corrective action can be taken instantaneously in case of machine failure. Work place should be neat and cleaned. Garg & Deshmukh [10] stated that there is great need for education and training for employees and involvements of top management is must for implementation of JIT purchasing. This concept gives support to implement the quality management techniques in JIT environment and also provide significant benefits in area of cost, quality and service. According to Vikas and Garg [29] that statistical quality control, statistical process control and work centered quality control can be easily implemented but the goal of zero defect is difficult to achieve in Indian context. The survey also revealed that some benefits like increased quality, increased productivity, reduced inventories, improved competitive position, improved worker efficiency, increased flexibility, reduced production lead time ,reduced purchase lots size and reduced work in process are highly expected JIT benefits in Indian context. Garg et al. [9] stated that a survey of Indian manufacturing industries to find extent of relevance of JIT attributes. Questionnaire was developed and administered to 70 industries. Responses from 31 industries were obtained. Data collected were analyzed with the help of factor analysis on a scale. The scope of JIT implementation was found 70 on scale (0-100), which can be said 'fairly good'. This study has predicted better scope of JIT implementation in India compared to earlier studies. Vikas et al.[30] stated that traditional view permits small but allowable amount of poor quality product in outgoing manufacturing goods .On contrary, JIT based quality management does not allow poor

quality product in any quantity by focusing the special attention on efforts to get high quality products in small lots. The basic principles of JIT based quality management are high level of visibility on quality management are high level of visibility on quality, strict product quality compliance, participation in control of product quality, self- correction of work-generated defects, 100% quality inspection of products, routine maintenance and house cleaning duties, continual quality improvement and long term commitment to quality control efforts. Due to these principles, JIT motivates workers to achieve quality perfection of products.

4. JIT Implementation Phases:

The JIT system is not new to the present scenario of industrialization. This technique is not limited to any particular country but due to its large potential of benefit it has a widespread application throughout the world. Many industries have adopted it and others are going to implement it for their survival in the fast competition at each stage in each area. In terms of planning and organizing for implementation, JIT itself is not a onetime project. However, converting the manufacturing system to a JIT environment can be treated as a project, with specific phases to be performed in a sequence. Each phase comprises several activities having well defined precedence relationship. These phases can be linked together to develop a JIT project network, such network will be extremely helpful as it not only identifies in detail the activities to be performed, but also gives their sequences. The network comprises eleven phases which cover planning and analysis of activities, formulation of operating systems, and evaluation and improvement functions. The eleven phases are the following:

- (1) Preparation
- (2) System investigation
- (3) Support activities
- (4) Formation of assembly and sub assembly lines
- (5) Formation of cells
- (6) Lay out design
- (7) Lead time reduction
- (8) Building system stability
- (9) The design of pull system
- (10) Supplier integration
- (11) Maintenance and continual improvement

5. Benefits of JIT System

The JIT system is aimed at improving profits, and return on investment through cost reductions, inventory reductions, and quality improvements. These benefits explain wide acceptance of JIT in industry. The following are some benefits of a JIT system stated by researchers:

- Close supplier/customer relations [15, 16, 19, and 23]
- Fast response to engineering changes [13, 15, and 17]
- Improved competitive position [4]
- Improved equipment efficiency [4, 6, and 14]
- Improved worker efficiency [4, 6, and 14]
- Improved worker motivation [4, 6, and 14]
- Increased administrative efficiency [13, 17]
- Increased equipment utilization [12]

- Increased flexibility [13, 20, and 21]
- Increased inventory turns [12]
- Increased profit margin [4]
- Increased team work [6, 14]
- Less scrap [6, 14, and 17]
- Lower overheads [20, 21]
- Reduced product cost [4, 13]
- Reduced production lead time [4]
- Reduced purchasing lot size [16]
- Reduced raw materials/parts [6, 14, 20 and 21]
- Reduced space requirements [4, 6, 12, 14, 17, 20 and 21]
- Improved quality [4, 6, 12, 13, 14, 15, 17, 20 and 21]
- Increased productivity [6, 13, 14, 17, 20 and 21]
- Reduced inventories [4, 6, 12, 14, 16 and 17]
- Reduced labour requirements [4, 12]
- Reduced paper work [4]
- Reduced work-in-process reduction [6, 14, and 20]

6. Obstructions for implementation of JIT in Indian manufacturing industries:

Implementation of JIT in Indian manufacturing sector can be generated enormous saving and a new productivity ethics can be created that may be helpful to strengthen the Indian economy. Also, the JIT practices can help the Indian industries to become more competitive by enhancing their export in world market. But, it is observed that social, cultural and political matters have a significant impact on JIT practices in different parts of world. In India suppliers of several raw materials are subjected under government control through supply agencies, which translates in to high uncertainty. Government control prices of key resources and taxation rates; all creates obstructions in way of implementing the JIT [22]. Some reason for slow implementation of JIT are listed below

- (1) Lack of team work
- (2) Lack of training
- (3) Lack of support from R&D department
- (4) Lack of customer awareness about product quality
- (5) High cost of implementation
- (6) Lack of understanding about JIT techniques
- (7) Traditional methods of quality control
- (8) Shortage of multifunctional workers
- (9) Poor and inadequate maintenance
- (10) Informal and casual quality auditing
- (11) Negative attitude and beliefs of Indian labor
- (12) Lack of communication at various levels
- (13) Lack of top management participation in QC programs

7. Concluding Remarks:

JIT concept has changed the way of manufacturing organizations do things. Some of the JIT concepts are completely opposite to traditional ways of thinking. It is human nature to resist change, and the implementation of JIT system is typical of this. People resist these new ideas and call them risky. But it is important to realize that JIT will not work if it has to be forced against everybody's will. Voluntary participation and training is necessary. Being a philosophy, JIT does not restrict itself to high technology manufacturing environments which make extensive use modern technologies like flexible manufacturing systems (FMS) or computer integrated manufacturing (CIM). JIT philosophy is valid in any manufacturing environments, regardless of the level of automation in the technology hardware. Organizations with motivated and well-trained workforce under the leadership of a committed management focus on five areas i.e., solid leadership, team based culture, communication systems, simultaneous development and continuous improvement processes and produces better results with the implementation of JIT - Upadhye et.al. [27]. similarly the philosophy is not limited to any specific type of industry nor does the size of the organization matter. Organizations of different sizes, in a variety of industries, have successfully implemented JIT philosophy.

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