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JIT Implements in manufacturing industry – A Review

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Abstract— In the present global and competitive Environment manufacturing industry face many problems. Just-In-Time manufacturing philosophy helps to reduce the problem. Just In Time is a Japanese management philosophy applied in manufacturing which involves having the right items of the right quality and quantity in the right place and the right time. JIT has been widely reported that the proper use of JIT manufacturing has resulted in increases in quality, productivity and efficiency, improved communication and decreases in costs and wastes. Just in time is very useful for increasing the productivity of companies, reduce delivery time, improve the quality of product and improve customer satisfaction and raising firm's efficiency. This study is aimed to review the research work made by several researchers on just in time philosophy.Past research have shown that Just in Time manufacturing system is considered as the best manufacturing system for attaining manufacturing excellence in the present scenario of globalization.

Keywords— Just In Time, JIT implementation, Economic Order Quantity, Inventory, Kanban Systems, Quality.

INTRODUCTION

JIT is a Japanese management philosophy which has been applied in practice since the early 1970s in many Japanese manufacturing organizations. It was first developed and perfected within the Toyota manufacturing plants by Taiichi Ohno as a means of meeting consumer demands with minimum delays (Goddadrd, 1986). For this reason, Taiichi Ohno is frequently referred to as the father of JIT. The Toyota production plants were the first to introduction JIT. It gained extended support during the 1973 oil embargo and was later adopted by many other organizations. The oil embargo and the increasing shortage of other.

Natural resources were seen as a major impetus for the widespread adoption of JIT. Toyota was able to meet the increasing challenges for survival through an approach to management different from what was characteristic of the time. This approach focused on people, plants and system. Toyota realized that JIT would only be successful if every individual within the organization was involved and committed to it, if the plant and processes were arranged for maximum output and efficiency, and if quality and production programmers were scheduled to meet demands exactly.

JIT had its beginnings as a method of reducing inventory levels within Japanese shipyards. Today, JIT has evolved into a management philosophy containing a body of knowledge and encompassing a comprehensive set of manufacturing principles and techniques. JIT manufacturing has the capacity, when properly adapted to the organization, to strengthen the organization's competitiveness in the marketplace substantially the organization's competitiveness in the marketplace substantially by reducing wastes and improving product quality and efficiency of production. The evolution of JIT as observed in the literature is discussed in some detail. Despite the plethora of literature, Zipkin (1991) asserts that a great deal of confusion exists about the subject. This, it is suggested, has led to a fundamentally different approach to JIT programmers in the west, which has the potential to be more damaging than beneficial. There is strong culture aspects associated with the emergence of JIT in Japan. The development of JIT within the Toyota production plants did not occur independently of these strong cultural influences. The Japanese work ethic is one of these factors. The work ethic emerged shortly after World War II and was seen as an integral part of the Japanese economic success. It is the prime motivating factor behind the development of superior management techniques that are becoming the best in the world. [1]

JIT IMPLEMENTATION BENEFITS

A successful JIT implementation may provide significant benefits for the operation of the whole company. There have now been a sufficient number of JIT implementations to demonstrate that JIT, when successfully implemented, will:

1. Reduce inventory levels, probably by about 50 per cent.

2. Improve quality levels.

3. Reduce scrap and rework rates

4. Reduce manufacturing lead times probably by 50-75 per cent
5. Improve customer service levels
6. Improve employee morale [2]

PRINCIPLES OF THE JIT PHILOSOPHY

(i)Attack fundamental problems: JIT maintains there is little point in making major problems such as capacity bottlenecks or poor quality vendors. It is far better to solve these fundamental problems and avoid a fire fighting' style of management.
(ii)Eliminate waste: Waste is any activity that does not add value. Samples of such activities are inspection, transport and inventory. JIT stresses that these activities need to be eliminated to improve the overall operation of the company.
(iii) Strive for Simplicity : Any approach that is adopted should be simple if it is to be effective. Previous approaches to manufacturing management have been based on complex management of a complex manufacturing system. By contrast, JIT implementation simplify the flow of materials and then superimposes simple control.
(iv)Devise systems to identify problems: In order to solve fundamental problems, they need to be identified. A JIT implementation will include mechanisms that will bring problems tom the fore. Examples of these mechanisms are statistical quality control (SQC), which monitors the manufacturing process and draws attention to any defect-producing trend, and pull kanban systems, which identify bottleneck production areas.
These four principles for the basis of any implementation but the way in which they are implemented may vary. [2]

LITERATURE REVIEW

Rajesh R. Pai etal [3] have use the modelling and simulation in the manufacturing industry where assemblies are made as per the production forecast. In this study observe how the Finished Goods Inventory of the assembly process using System Dynamics methodology and how it can be improved by considering the lead time and the manufacturing cycle time. The Authors have conduct Vensim software to study the process productivity through Just in Time On successful implementation of the suggestions, there will be continuous and accurate flow of materials at the right time and in the right quantity.
Zaidahmed Z. Khan etal [4] have to implementation of basic JIT tools such as 5S, Layout, Cause and effect diagram, visual controls, rewards and incentives schemes, point of use storage, and quality at the source in manufacturing industry. The authors have use 5S technique of JIT was applied and accordingly plant layout was changed, there was reduction in manufacturing timing of the product. Technique was used in painting, filter and hydrotesting department. There was reduction in approximate 275 minutes of operation time of double window sight flow indicator. JIT helps in reduction of waste and gradually production time will increase and hence overall efficiency will increase. One of the biggest problem, the company was facing by the top management, was unpredictable overtime. Overtime not only consumes workers enthusiasm positive energy efforts but also the companies additional expenditures including the wages from bottom line workers to supervisors and Quality Control engineers. Implementing the rewards and incentives schemes the overtime tradition can be eliminated and also increases the motivation of the employees.
John F. Kros etal[5] have designed to examine five financial measures of inventory management performance over the years 1994-2004.The Authors have to apply actual practical implications – The processes that influence the reduction in inventory levels may be in fact more complex and strategic in nature than an OEM adopting a JIT inventory policy. In general, strategic changes within the supplier organization would have to drive process improvements that lead to inventory reductions.
Dr. Kavita A. Dave[6] have to focus the purchasing aspect of Just-In-Time (JIT) considering varying setup costs. Author has developed a model which shows the determination of economic order quantity for perishable product. The perishable product cannot be held for a long time and hence JIT is the best suitable which reduces the amount of inventory and its cost significantly.
Adam S. Maiga etal [7] have to uses a sample of 131 just-in-time (JIT) firms and their matched non-JIT firms to examine whether adoption of JIT improves firm performance. Tobin's Q and return on assets (ROA) are used to measure firm performance.
Bo Hou, Hing Kai Chan, and Xiaojun Wang[8] have to reveals some key findings in implementing JIT systems under five themes. In particular, the whole logistics system and the relationship with suppliers are of vital importance. I addition, this study also supports the benefits of applying JIT systems.
Ignatio Madanhire etal [9] have investigate the use of Just in time (JIT) concept for the aluminium foundry industry and explores the adaptation of the manufacturing approach to metal foundry, where raw materials are imported in a highly unstable economy. The Authors were observed that JIT was applied to improve cost effectiveness of operations, quality and to achieve world class benchmarks on all facets of the engineering entity as competitiveness in product delivery is getting to be mandatory for business survival.
Low Sui Pheng and Gao Shang [10] have found that JIT application was address the low productivity, low profitability and low quality issues in China's construction industry.
Ayman Bahjat Abdallah etal [11] have studied that the constructs multi-item scales to measure key components of JIT production and manufacturing strategy and examines the relationship between them, and the impact of manufacturing strategy on JIT performance for machinery, electrical & electronics and automobile industries in Japan, USA, and Italy. The authors were observed from regression analysis show that after controlling for the industry and country effects, manufacturing strategy scales have positive and significant impact on JIT production and also show that manufacturing strategy scales have positive and significant impact on JIT performance.

Jayanta K. Bandyopadhyay[12] studied that the selecting JIT, as a mode to adapt to the changing business environment, there is a lot of confusion as to how to organize an effective JIT system. The author was identify the key strategies for successful implementation of JIT production and procurement and emphasize the need for top management commitment with a dynamic organization structure in order to incorporate the necessary changes that need to take place in an organization so that JIT implementation can take place in an effective manner.

S. L. Adeyemi[13]studied that the extent of JITPS in a typical third world country-Nigeria, with a view to identifying the extent of adoption as well as the hindrances on the part of adopting the technique. Structured questionnaires were administered to companies to indicate whether or not they were adopting the technique. The author have found that fairly larger companies adopt JIT method more while the relatively smaller ones are still not aware of the existence of the technique.

A. Gunasekaran etal [14]studied that the implementation of JIT in a small company in Taiwan that produces different kinds of automobile lamps such as rear combination lamps and front turn signal lamps.Authors have observed that JIT systems have tremendous effects on all operations of a firm, including design, accounting, finance, marketing, distribution, etc., and thus are of interest to all levels of a firm's management.

CONCLUSION

Just-in-Time philosophy is easy to implement but it can wary according to the size of the organization , variety of industries, level of automation , number of product and implementation of the new technology. JIT implementation mostly successful by positive co-ordination of top management to all level of employee. Sometimes, these concepts are differ from our traditional ways of thinking therefore its implementation creates many difficulty because human nature to resist change. Many researchers implements' JIT in small, medium and large organization and they were observed that enterprises are not familiars with the Just in Time manufacturing system because of lack of knowledge of JIT concept, Not given proper training of JIT and lack of Top management involvement. JIT concept was address the low productivity, low profitability and low quality issues in manufacturing industry. JIT concept improve cost effectiveness of operations, quality and to achieve world class benchmarks on all facets of the engineering entity as competitiveness in product delivery is getting to be mandatory for business survival. JIT helps in reduction of waste and gradually production time will increase and hence overall efficiency will increase.

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