

Difficulties of Just-In-Time Implementation

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Abstract – Many companies experience difficulty in implementing Just-in-Time (JIT) in their manufacturing system. Based on observations, the article argues that the problem is partly due to confusion about JIT and its implications and partly due to a desire to implement JIT within an existing organisational structure. A four-level classification system is presented as a way of summarising the different degrees of JIT implementation and their difficulties. JIT philosophy has been of great interest to the manufacturers and researchers over the past few decades. JIT systems are designed to produce the goods & deliver services as and when required. JIT systems are capable to attain the far-reaching productivity and quality standards. Numerous benefits have been claimed by the firms implementing JIT across the World. Efforts are being made day-by-day to look into the benefits and their feasibility in the Manufacturing Industries. Despite the profound interest in it, the extent of implementation in India has not been satisfactory. Many firms which had benefitted from JIT systems appear to address only a few features, rather than looking into the whole philosophy of JIT. The paper attempts to address the necessary initiatives required to be taken by the Management of Indian Manufacturing Industry for the implementation of the various JIT subsets, through a survey based on previous literature. Further, it analyzes and concludes the modification of procedures and operations required for its successful implementation along with the challenges encountered during the JIT philosophy implementation.

I. INTRODUCTION

Many companies experience difficulty in implementing Just-in-Time (JIT) in their manufacturing system. Based on observations, the article argues that the problem is partly due to confusion about JIT and its implications and partly due to a desire to implement JIT within an existing organisational structure. A four-level classification system is presented as a way of summarising the different degrees of JIT implementation and their difficulties. Just-in-Time

philosophy, which Toyota Motor Company is credited with developing and operating back in the early 1980 has attracted and received considerable interest from industries and academics worldwide. It is one of the major factors considered for Japan's competitive success. The literature of JIT contains a variety of definition ranging from Schonberger[1] 'To produce and deliver finished goods just in time to be sold, sub-assemblies just in time to be assembled into finished goods and purchased materials just in time to be transformed into fabricated parts'.

To Benson [2] who summarized the JIT concept adopted by manufacturing organizations as:

- Total visibility-of equipment-people, material and process.
- distribution of responsibility-line operator are responsible for production and improvement
- wholesome approach for waste elimination

In order to survive today's emerging competitive market; Indian manufacturers have been adopting innovative manufacturing philosophies and approaches to seek new ways to develop competitive edge. Despite the immense potential to improve performance, effectiveness and efficiency through JIT approach; Indian industries have not yet tested the full effect primarily due to the implication of a few features rather than the overall philosophy and system. Before an organization enjoys the benefit of JIT, it must accept JIT as a philosophy. This may require a high level of organizational modifications which may be technical, cultural or structural but the benefits claimed from successful implementation of JIT philosophies and theory by researchers ([1] and Voss and Robinson 1987 [3]) which include reduced lot sizes, improved quality, reduced waste and rework, improved motivation, greater

process yield, increased productivity, increased flexibility, reduced space requirement, lower reduced overhead manufacturing cost, reduced lead time and improved problem solving capabilities outweigh the implementation modifications required.

Hence in light of the potential benefits of JIT implementation a survey was conducted to find the hurdles faced in the implementation of various JIT elements and organizational modifications required for the successful deployment of the various JIT elements and necessary management initiatives required. Although in an Indian organization it is not an easy job but several attempts are being made to implement JIT in a phased manner with the belief that it would be helpful in facing global competition.

II. PREVIOUS RELEVANT LITERATURE

Many research papers have been written which highlight the potential benefits of JIT in India.

S G Deshmukh[5] has pointed out that JIT from a system perspective requires a deep understanding of the supplier and manufacturing function about design planning and control.

Garg, Vrat&kanda[6] has explored the required changes in work culture for JIT implementation. The paper stated that trust, locality, motivation and authority. It is critical for industries to make conscious and deliberate effort for successful JIT implementation. These changes require the top management involvement, massive training and education

Tyagi&Vrat [4] which conducted a study to assess the applicability or difficulty of implementing JIT elements in Indian context. The results showed quality circle and good communications are not very difficult to implement, top management initiative, multifunctional workers have high ratings which conclude that jit implementation is possible.

Singhvi[9] has presented the experience of implementation the JIT in an Indian automobile company the JIT in an Indian automobile company. The study found the employee involvement

As a critical element for implementing the JIT, while large investments are not found essentials. At last, it is concluded that implementation of JIT is not so difficult in India. Its implementation could be a great opportunity for Indian industries due to its wide range of benefits

Mahadvan[8] conducted survey on 43 Indian industries. He found the automobile industry in India has made significant improvement in implementation of elements such as multi skilling of work force, total

preventive maintenance and JIT purchasing. Employee involvement and Top management commitment are prominently listed as critical success factors.

Chandra and Kodali [9] quantified the JIT benefits in increasing order as follows

- Reduction in inventory
- Quality improvement
- Improved Competitive position
- Increased profit margin

III. FRAMEWORK AND PROPOSITION

From previous literature it is clear that JIT philosophy has great potential in the Indian industry. However, a study by Boone and Whybark [10] has shown that there are greater performance differences between countries than between industries. There is also more difference in manufacturing practices affecting performance than between industries. Thus sometimes a different set of practices are useful for improving the same dimension of competitiveness.

Hence to evaluate the basic factors, hurdles and management initiatives required in implementation of JIT approach, a survey was conducted in manufacturing plants in India primarily situated in Haryana and Punjab. The basic objective of this paper was an attempt to evaluate

- The level of difficulty faced in implementation of various JIT subsets and reasons for their slow implementation
- The various organizational modifications and management initiatives required for the successful JIT implementation based on the survey

IV. METHODOLOGY

This study was conducted in four phases.

The first was Questionnaire preparation where a lot of intensive study and review of literature related to JIT was undertaken from various sources. Based on our finding, the various elements of JIT were defined and at last a questionnaire was prepared. It contained question related to company its policies future growth and expectation, Process followed level of awareness about the JIT approach. Organizational modifications needed in order of priority for JIT implementation, the common problems for not implying JIT philosophy. The second phase was to collect the data which was done by mailing the questionnaire to the industry, in some areas data was collected by conducting interviews.

The general profile is given in the table 2 below of the different plants is given below:

Table 1

COMPANY PROFILE	STATS
Annual Turnover (in crores)	152.00
Number of Employees(avg)	1250.00
Scope Of JIT	Good 4, Fair 3, Poor 1

V. ANALYSIS

The third phase data analysis was done in 2 parts, first was a suitable test was conducted at 5% level of significance to analyze level of difficulty in implementation of JIT elements the following hypothesis was used

- H_0 : no element of JIT is difficult to implement in Indian industry(the null hypothesis (H_0))

Will be rejected in JIT element subjected under test is not difficult to implement.

The results of the test are given in table 3 the study indicates that the JIT index as 6.36 on scale 0-10 implying that JIT implementation is difficult in Indian industries. It has been found that JIT elements such as zero defect, zero deviation, JIT supply, setup reduction, small lot size,

Equip layout are difficult to implement whereas the other parameters like employee involvement, Quality, training of worker and supplier and quality circle are relatively easy to implement

Table 2

S.No of JIT element	Mean score	CALCULATED	Results
Setup Reduction	3.606		H_0 rejected
Equipment layout			H_0 rejected
Small lot size			H_0 rejected
Short lead time			H_0 rejected
Design simplicity	2.255	-3.450	H_0 accepted
Employee involvement	3.204	-1.432	H_0 accepted

Multifunction workers	3.129	0.223	H_0 rejected
Quality JIT supply	3.323	0.550	H_0 rejected
Zero Defect	4.335	2.222	H_0 rejected
Training to worker and supplier	1.976	-6.889	H_0 rejected
Quality circle	4.065	2.134	H_0 accepted

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In the second part of Data analysis the survey was conducted in order to find the most common/frequent problem faced in the implementation of JIT elements such as inconsistent timing and quantities of delivery, inconsistent quality of incoming materials, worker resistance, lack of top management support, unwillingness of worker to perform multi tasks and lack of communication between management and workers were some of the common problems faced.

Based on the survey the high prior modification required for successful and easy implementation of JIT approach are given which clearly show It shows that proper training of workers to improve job skill and improving decision making was needed, Initiation of quality circles, simplification of layout, reduction in active number of vendors and automation were the critical modifications required according to the industries.

VI. MANAGEMENT INITIATIVES REQUIRED

Our results indicated that that firms in which the top management initiated the JIT elements implementation were significantly more successful than those initiated by either the accounts or purchasing departments. Although previous literature suggest that JIT is likely to be initiated at any of these departments the management therefore should find a way to ensure that the idea reaches the top management perhaps by ways of departmental manager report or a presentation at an executive meeting.

Hence based on the survey and previous literature six management initiatives are suggest for the proper efficient and smooth implementation of JIT approach in context to Indian Industry

- Provision of work force security
- Provision of proper training
- Demonstration of visible commitments
- Promotion of Teamwork
- Promotion of employee responsibility

VII. CONCLUSION

The results of the survey supported the notion that JIT has potential to increase the operational efficiency, quality and organizational effectiveness of Indian Manufacturing Industries.

This paper helped in finding the level of difficulty in implementation of JIT approach in manufacturing organization in India. It also focused on Pre implementation modifications and their impact on reducing implementation problems and on eventual success on JIT project. We also investigated the importance of top management involvement in the initiation of JIT project and derived 6 basic management initiatives for the quick, efficient and smooth implementation of JIT approach.

The potential benefits of JIT to Indian organization are not in doubt. However the art of designing the right strategy for implementing the JIT in Indian industries is still in question and requires further research and analysis.

VIII. REFERENCES

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