

Implementation of JIT in India SMES

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Abstract: *It is perceived that Just-In-Time (JIT) is highly beneficial in manufacturing industry. However recent studies revealed that service industries are improving their operations using JIT. A descriptive analysis of the papers reviewed is provided. From the thematic analysis four main themes are identified from the literature: the scope/type of Lean being adopted by SMEs, how Lean was used in SMEs, the impact of Lean implementation on SMEs and the critical success factors for Lean implementation in SMEs. The operations and activities in many service systems are sequentially similar to activities in manufacturing system. But there is a need to assess the critical elements of just in time specific to service industries. In this paper, the critical elements of the JIT in the context of Indian service industries were identified using a mail survey approach. The questionnaire was sent to the 60 service industries and 30 industries responded. On the basis of the responses, critical elements were identified. Attempts have been made to examine the degree of importance and degree of difficulties of these critical elements in Indian service industries. A matrix has been suggested to branch off the difficult and important elements. The results revealed that JIT plays important role in service industries. It is recommended that the elements which are less difficult but more important should be implemented at the initial stage.*

Keywords: JIT, SMES



INTRODUCTION

Now a day companies develop and implement strategies that will give them a competitive advantage. A company that improves performance on a regular and continuous basis certainly will gain a competitive edge. Companies seek competitive advantage by emphasizing on performance factors such as flexibility, quick responsiveness, cost, efficiency, quality, reliability and service. JIT manufacturing is the ideal strategy to achieve these desired objectives. JIT is indeed a system, which consists of a series of techniques. JIT provides cost efficient production in an organization and delivery of only the necessary parts in the right quantity at right time and place while using the minimum facilities. JIT enables one to conceive, design, implement and operate a manufacturing and supporting systems, as an integrated whole, based on the principles of continuous improvements and elimination of all kind of waste.

It is an assembling reasoning that was produced by the Japanese. It is centered around streamlining generation effectiveness by finding the harmony among quality and amount to portray a stylish perfect (Wyk and Naidoo, 2016). This logic was first connected in the 1970's. Taiichi Ohno first created it at Toyota. Initially JIT was actualized essentially to guarantee the conveyance of merchandise to clients precisely, with respect to request time, item quality and amount. In any case, this comprehension and utilization of JIT has turned out to be increasingly mind boggling in the ongoing years. JIT is currently a key player in guaranteeing that generation of products happens with least waste. Toyota being one of the main cars makes, following quite a while of consistent enhancement, went to an acknowledgment that there are seven kinds of waste constantly present in assembling. These squanders result from: overproduction, misuse of holding up time, transportation squander, process squander, stock waste, misuse of movement and waste from item deserts (Suzaki, 1989).

JIT contains eight components which incorporate consistent enhancement, disposing of waste, great housekeeping, setup time decrease, leveled/blended generation, Kanban, Jidoka and Andon. Japan is known for its real fares of cars, buyer gadgets and PCs, therefore it ought not to come as an unexpected that it was the Japanese that created and reasoning that would reform the manner in which the world does assembling and handle stock. The world has been watching,





taking in and actualizing different methods of insight from the Japanese with regards to assembling and JIT is one of those rationalities.

JIT was developed by Toyota's vice president Taiichi Ohno. In 1960's, the idea was formalized into a management system, when TOYOTA sought to meet the precise demand of customers for different models and colors with minimum delay. Toyota production system has played a vital role in the development and popularization of JIT all over the world. By 1972, new approaches have begun to attract wide attention in Japan. In mid 1970's other Japanese companies began to experiment to adopt these approaches. Then, by the end of 1970's JIT system attracted the attention in the west. The JIT concept was first transferred to the United States around 1980 at Kawasaki's Lincoln, Nebraska. Since then many of the best corporations in the United States, including those in the automotive and electronics industries, have followed suit and have begun implementing JIT. But still concept is just beginning to be understood and used by many industrial enterprises throughout the world today.

LITERATURE REVIEW

Many researchers have carried out significant work in the area of JIT. The literature related to the present work was reviewed. Inmam and Mehra (1990) stressed upon the applicability of JIT in service environments, including service part of manufacturing line. Some benefits of JIT were reported as improved communication, elimination of warehouses, reduced supplier base, improved vendor performance, improved quality, improved service, lower price levels, quick response time etc. Benson (1996) reported that diverse service organizations from bank cheque processing centers to hospital operating rooms are now applying JIT philosophy to the special problem of service production. It was hoped that service industries will continue to investigate the potential advantages of JIT and soon the list of successful case histories will include hotels, educational facilities and leisure establishments Garg et al. (1996) analyzed some vital issues in JIT purchasing in an Indian context on the basis of a questionnaire (n=28) sent to 80 different Indian Industries. The issues include the importance of JIT attributes, problems in implementing JIT, and expected benefits from JIT purchasing implementation. Some research directions were also identified for future work. Garg and Deshmukh(1999) said that JIT have great importance in





Indian context due to its wide range of benefits. Although, the success stories of these management philosophies are limited in India yet, several Indian Industries are implementing basic principles of JIT.

Yasin and Small(1994) concluded on the basis of investigation of 86 organizations of US public sector, that JIT is a form of “managerialism”, has the potential to increase the operational efficiency, service quality and organizational effectiveness of public sector organizations. Sharma and Singh (2005) conducted a case study on two Indian agricultural equipment-manufacturing companies, which have implemented JIT. In one case the profits of the company were found to have increased by 10%. While in the second case the company was successful in reducing the level of inventory by over 20%

RESEARCH METHODOLOGY

The elements of JIT, which affect the performance of Indian service industries, were identified through literature survey [8,6] etc. A questionnaire was designed to collect the relevant data regarding the quantum of importance, difficulties, expected benefits and the possible constraints in the implementation of JIT in Indian industries. Questionnaire had two sections A and B. Section A carried general information regarding the industries like, annual turn-over, number of employees, ISO certification, whether they are implementing JIT or not, type of product manufactured etc. In section B main emphasis was given to degree of importance, and degree of difficulties regarding JIT in Indian service industries. The questionnaire prepared was based on 5 point Likert scale. This questionnaire was then sent to the various service industries (N=60). Industries were selected from northern India and are situated at Chandigarh, Delhi, Punjab, Haryana, Himachal Pradesh etc. Out of 60 the 30 responses were collected. The collected data was arranged in order and analyzed by checking it at 95% acceptable limit through t-test. SPSS-11.0 software was used to make the calculation work easy. Conclusions were then drawn on the basis of this analysis. Here importance of JIT elements means that how much an element is important for the industry i.e. automation, bar code technology etc., whether it is important for the industry or not, if yes, then how much. Similarly, difficulties of JIT elements show that how much an element is difficult to implement in industry. For this, forty most important elements,





according to the Indian service industries, were chosen on the basis of literature survey (Anderson and Elziabeth 2000, Billesbach 1991, Vikas and Garg 2000, Garg and Gupta2003). The importance and difficulties of JIT elements were evaluated by 5-point Likert method. The mathematical analysis was done according to the score of each element. Cross tables to check the impact of company profile on the use of JIT.

DEGREE OF IMPORTANCE IN SERVICE INDUSTRIES

The data was collected from the selected service industries and analyzed. The results of degree of importance are given in the table 1. The table consists of mean value, standard deviation and value of t-calculated. The values of five elements i.e. group technology, process simplification; statistical process control, waste reduction and zero defects did not fall in the acceptable range. Figure 1 represents the score of each important element for all the selected service industries. The elements are plotted along x-axis while their scores are along the y-axis. The most important element recognized by the Service industries was waste reduction (mean=0.8929). The least important element was JIDOKA (mean=0.5625).

Table 4.1 Between-Subjects Factors

| | | Value Label | N |
|-----------------------------|------|---------------|----|
| Type of Company | 1.00 | Manufacturing | 83 |
| | 2.00 | processed | 18 |
| Category of the company | 1.00 | Large | 4 |
| | 2.00 | Medium | 31 |
| | 3.00 | Small | 66 |
| JIT training carried by You | .00 | No | 94 |
| | 1.00 | yes | 7 |





Table 4.2 Dependent Variable: JIT implemented or not

| Type of Company | Mean | Std. Error | 95% Confidence Interval | |
|-------------------------|-------------------------|--------------|-------------------------|--------------|
| | Lower Bound | Upper Bound | Lower Bound | Upper Bound |
| Manufacturing processed | .471(a) 7.95E-016(a) | .076 .111 | .320 -.221 | .622 .221 |

Table 4.3 Dependent Variable: JIT implemented or not

| Category of the company | Mean | Std. Error | 95% Confidence Interval | |
|-------------------------|-------------|-------------|-------------------------|-------------|
| | Lower Bound | Upper Bound | Lower Bound | Upper Bound |
| Large | .500(a) | .151 | .200 | .800 |
| Medium | .272(a) | .072 | .129 | .416 |
| Small | .013(a) | .100 | -.186 | .211 |

Table 4.4 Dependent Variable: JIT implemented or not

| JIT training carried by You | Mean | Std. Error | 95% Confidence Interval | |
|-----------------------------|-------------|-------------|-------------------------|-------------|
| | Lower Bound | Upper Bound | Lower Bound | Upper Bound |
| No | .126 | .067 | -.007 | .259 |
| yes | .533(a) | .142 | .252 | .814 |





Table 4.5 Dependent Variable: JIT implemented or not

| Type of Company | Category of the company | JIT training carried by You | Mean | Std. Deviation | N |
|-----------------|-------------------------|-----------------------------|--------|----------------|----|
| Manufacturing | Large | No | .5000 | .70711 | 2 |
| | | Yes | 1.0000 | . | 1 |
| | | Total | .6667 | .57735 | 3 |
| | Medium | No | .2174 | .42174 | 23 |
| | | Yes | .6000 | .54772 | 5 |
| | | Total | .2857 | .46004 | 28 |
| | Small | No | .0385 | .19418 | 52 |
| | | Total | .0385 | .19418 | 52 |
| | Total | No | .1039 | .30713 | 77 |
| | | yes | .6667 | .51640 | 6 |
| Total | | .1446 | .35381 | 83 | |
| processed | Large | No | .0000 | . | 1 |
| | | Total | .0000 | . | 1 |
| | Medium | No | .0000 | .00000 | 3 |
| | | Total | .0000 | .00000 | 3 |
| | Small | No | .0000 | .00000 | 13 |
| | | yes | .0000 | . | 1 |
| | | Total | .0000 | .00000 | 14 |
| | Total | No | .0000 | .00000 | 17 |
| | | yes | .0000 | . | 1 |
| | | Total | .0000 | .00000 | 18 |
| Total | Large | No | .3333 | .57735 | 3 |
| | | yes | 1.0000 | . | 1 |
| | | Total | .5000 | .57735 | 4 |
| | Medium | No | .1923 | .40192 | 26 |

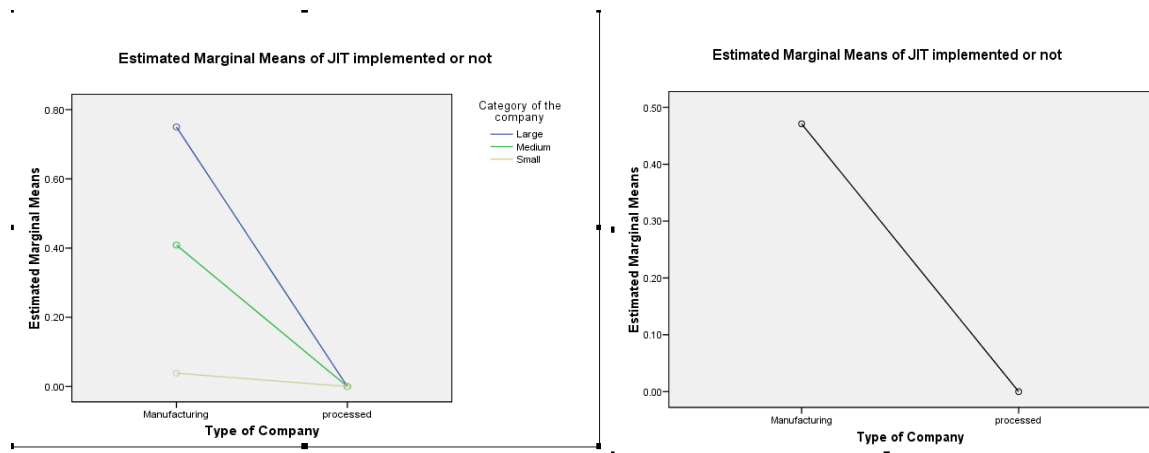


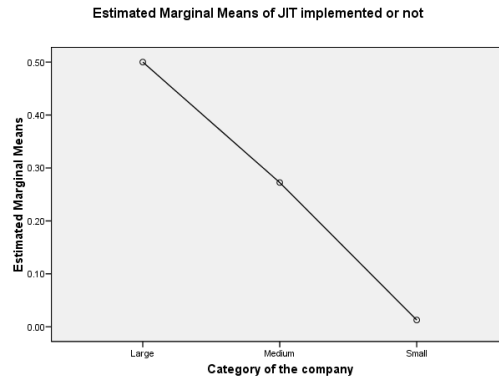


| | | | | | | |
|--|--|-------|-------|--------|--------|--------|
| | | yes | .6000 | .54772 | 5 | |
| | | Total | .2581 | .44480 | 31 | |
| | | Small | No | .0308 | .17404 | 65 |
| | | | yes | .0000 | . | 1 |
| | | | Total | .0303 | .17273 | 66 |
| | | | Total | No | .0851 | .28054 |
| | | | yes | .5714 | .53452 | 7 |
| | | | Total | .1188 | .32518 | 101 |

5. DEGREE OF DIFFICULTIES IN SERVICE INDUSTRIES

To check the degree of difficulties in case of service industries the same procedure was adopted as in case of degree of difficulties. The data was collected from the service industries and then analyzed. Table 2 illustrates the mean value, standard deviation and value of the t-calculated. Analysis disclosed that all the values come in the acceptable range. The score of each difficult element is shown in figure 2. The most difficult element recognized by the service industries was total productive maintenance (mean=0.4911). The least difficult element was automation (mean=0.2232).





STATUS OF JIT ELEMENTS IN SERVICE INDUSTRIES

To check the status of degree of importance and degree of difficulties, a graph was prepared as shown in figure 3. The graph was divided into four zones such as; zone 1- less important and high difficult elements to implement, zone 2- less important and less difficult elements to implement, zone 3- most important and less difficult elements to implement and zone 4- most important and high difficult elements to implement. It is clear from the graph that the most of the elements fall in the zone 3 i.e. most important and less difficult. Hence, for the successful implementation of JIT, concentration should be focused upon these elements. The elements, which lie in the zone-1, are less important and difficult to implement; the industries can neglect these JIT elements to implement. It is concluded from the study that the elements which are less difficult and more important should be implemented at the initial stage. Group Technology, Product simplification, Process improvement, Customer Care, Process simplification.

About 90% of industries reported that their suppliers make delay by a day or two in their deliveries as compared to just 10% suppliers making deliveries on time. This seems to be one of the principal reasons why Indian industries are facing difficulties in implementing JIT.

About 92% of industries answered in negative about their suppliers' cooperation in JIT implementation compared to just 8% being supportive. This is directly linked with timely deliveries made by the suppliers to their manufacturers. In about 91% cases, the manufacturers have three or more than three suppliers. It may be because of the reason that manufacturers think that larger number of suppliers will help to reduce uncertainty in the deliveries of supplies.



CONCLUSION

Most important elements for service industries are total productive maintenance, process flexibility, JIT purchasing, smooth flow of materials, house keeping, process flexibility, set up time reduction, administrative efficiency. The difficult elements for service industries are total productive maintenance, quality function deployment, standardization, standard containers, and quality circles. It is recommended that the service industries should implement most important and less difficult elements at the initial stage

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