

Study and Analysis of JIT (Just in Time) approach using Attributes and Performance Parameters in SCM (Supply Chain Management)

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Abstract—Supply chain Management is to manage to procure the raw material, to convert it in form of finished/ semi-finished goods & products and to distribute the finished product to the end users. In many cases it is observed that sub-optimization exists in Supply chain Management due to some non-value added activities in the procurement of raw materials, production process and in distribution of finished products. This can be avoided by the proper planning, execution and monitoring of the activities of supply chain. Recent development in managing the supply chain has attracted JIT as effective tool to remove unproductive inventories, better inventory control, quick responses, effective communication between suppliers & end users and optimization of use of human resources. The literature highlights the JIT capability to overcome the inherent problems of supply chain like; undermining of Inventory level, waste elimination, long term relationships, free flow of information and effective human involvement. Existing Supply chain of Indian industries faces the above mentioned problems. This research is to address the JIT initiative in supply chains in order to get competitive advantages by reducing efforts in controlling huge amount of inventories so that inventory handling costs & efforts related to inventory stocks can be eliminated. The attributes of JIT supply chain have been identified from the Literature review. Recognition of untouched/ less attended issues highlights the research direction. Finally two research questions were set up. The first one is to find out applicability of JIT in Supply chain & by replacing cumbersome conventional methods of Indian industries second is to explore performance of supply chain due to JIT. Survey of Industries is carried out in many industries & firms & an attempt is done to find the solution of first question in terms of level of JIT, benefits, difficulties, importance and challenges of Implementation. It is found that applicability of JIT in SCM of Indian industries in terms of level, importance, benefits, problem solving and challenges are high. In second answer, the performance of Supply chain due to JIT has been explored in terms of performance of suppliers, manufacturers, distributors, information handling and Business. The raw material is supplied by the suppliers to the manufacturer and distributor facilitates the storage and delivery of finished product into the hands of the end users. As Just in time in supply chain highly improves total time of process, responsiveness, flexibility, quality, mutual coordination, information sharing and long term relationship. The mixed responses in survey of Indian industries also plead to explore the partial JIT application in supply chain. Indian industries are not fully ready to accept to implement all the attributes of JIT as in many industries still the conventional method of holding large inventories is used and they prefer to use them partially, so alternative of JSC. Hybrid Supply Chain (HSC) has been proposed as most suitable for Indian Industries.

Key words: JIT, SCM

I. INTRODUCTION

JIT:-Schonberg (1986) has defined JIT as a system to produce and deliver finished goods just in time to be sold, purchased materials just in time to be transformed into finished goods. The management of upstream and downstream relationships with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole. The expanding global competition, emerging new technologies and improved communications have increased customers' expectation of full satisfaction with the products and services that they purchase. These changes have, in recent years, brought too many manufacturing and service firms into the challenges of improving the satisfaction of their customers and the quality of their products and services. Faced with these challenges, business firms worldwide are prompted to look for ways to reduce costs, improve quality and meet the ever-escalating demands of their customers. One successful solution has been the implementation of JIT in Supply Chain Management, which involve many functional areas of a firm such as purchasing of raw materials, manufacturing, distribution, and marketing and purchasing, among others. This chapter provides an introduction which includes background, objective, scope and organization of the research works.

II. SCM FLOW CHART

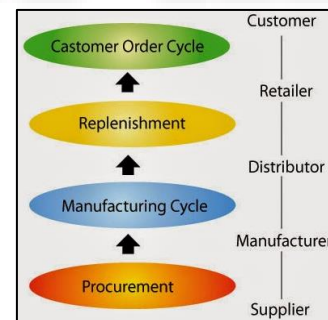


Fig. 1: SCM Flow Chart

III. JIT IN SUPPLY CHAIN MANAGEMENT

Integrated processes of procurement, manufacturing and distribution by using Just in time inventory

IV. RESEARCH OBJECTIVES

- The objective of this study is to highlight JIT applicability in various activities of Supply chain in context of Indian Industries.
- The study would explore actual trends of implementation of JIT in supply chain.
- This will lead to identify and understand different perspectives of JIT, attributes applicable in supply chains and performance of Supply chain due to it.

- To study various research papers and case studies for the different attributes and performance parameter (14) that is affecting the implementation of JIT in SCM.

A. Attributes of JIT in SC

1) In Procurement Process

- Selection of supplier
- Evaluation of supplier
- Training of supplier
- Participation of supplier
- Reduction in lead time
- Flexible supply
- Frequent Supply
- Certification of supplier

2) In Manufacturing Process

- Standardised work
- Produce to replenishment
- Elimination of waste
- Pull type production system
- Kaizen activities
- Group technology

3) In Distribution Process

- Fast response
- Integrated logistics
- Reliable transportation
- Third-party Logistics (3PL)
- Warehousing
- Fast Delivery

4) In Information Sharing

- Proper communication
- Electronic data exchange
- Synchronised supply and demand

5) In Human Involvement

- Trained workers
- Strong managerial team

B. Performance Parameter of JIT SC

1) Supplier's Performance

- Flexibility in SC
- Involvement at each stage
- Quality product

2) Distributor's Performance

- Efficient warehousing
- Efficient responsiveness
- Delivery Speed

3) Manufacturer's Performance

- Reduction in cycle time
- Reduction in inventory levels
- Reduction in scrap
- Quality Product

4) Performance of Information Sharing

- Data interchange frequency
- Data accuracy

5) Business Performance

- Return on investment (ROI)
- Market share
- Asset turn over (ATO)

S. No.	Performance Factor	Author	Year
1.	Increased Flexibility	Baides et.al.[1]	2012

2.	Increased involvement	Walker et.al [2]	2012
3.	Quality	Lou et.al. [3]	2013
4.	Reduced cycle time	Jamsheed J. Mistry [4]	2005
5.	Reduced man power	Holweg et. al. [5]	2005
6.	Quality product	Yasin et. al. [6]	2012
7.	Warehousing	Vokurka et. al. [7]	2010
8.	Responsiveness	Boersma and Kingma[8]	2005
9.	Delivery Speed	Wu and Pheng[9]	2006
10.	Data sharing frequency	Barlow [10]	2002
11.	Data accuracy	Lee et.al. [11]	2003
12.	Return on Investment (ROI)	Vanteddu, et.al.[12]	2011
13.	Market share	Ashby et.al. [13]	2012
14.	Asset Turn Over (ATO)	Maiga et. al. [14]	2009

Table 1: Performance Parameter

V. METHODOLOGY

A questionnaire based survey method is used to collect the responses from the suppliers regarding JIT practices in supply chain. Therefore, four phases of methodology is used here to reach on conclusion, these are

- Development of Questionnaire
- Data Collection
- Data Analysis
- Final Result & Challenges

A. Data Collection

The procedure used in this study is approach and consult, and respondents are main suppliers of the firm.

- Shri Ram foundry Pvt. Ltd. Pantnagar (UK)
- GhatgePatil Industries Kolhapur (MH)
- LumaxInterprices Pune (MH)
- Investment and Precision Casting Ltd. Bhawnagar (GJ)
- AlphacraftPvt. Ltd. Coimbatore (TN)
- Marvellous Engineering Kolhapur (MH)
- Shri Ram Foundry Kolhapur (MH)
- MantriMetalics Kolhapur (MH)
- Sound Casting Ltd. Kolhapur (MH)
- Solidus Pune (MH)
- Chromewell, Dewas (MP)
- Metal Forger, Ujjain (MP)

B. Data Analysis

A questionnaire has been prepared and data is collected and analysed using Likert's Scale. The response of following questions are recorded and analysed.

1) How is the attributes of JIT supply chain treated in Indian Industries?

- RQ1.: JIT level in Supply chain,
- RQ2.: Expected benefits of JIT,
- RQ3.: Degree of difficulty in JIT application in supply chain,
- RQ4.: Degree of importance of JIT in Supply chain,
- RQ5.: Challenges in JIT implementation

2) How are factors of performance affecting the Supply Chain?

- RQ1.: Supplier' performance,
- RQ2.: Manufacturer's performance,
- RQ3.: Distributor' performance,
- RQ4.: Performance of information sharing and
- RQ5.: Business performances

Mean of each RQ response is calculated to derive the result.

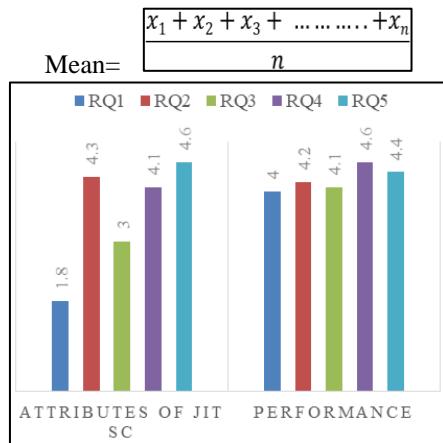


Fig. 2: Data Analysis

VI. RESULTS

Supply chain has taken new turn with the application of JIT philosophy in increasing the “responsiveness, maintaining low level of all types of inventories, elimination of wastes and a continuous improvement approach” in its core stages.

VII. CONCLUSIONS

Some of JIT elements like zero inventories, nil wastage and pull production are hardly implemented in most of the industries on the other hand firms do not want to leave merits of JIT. Therefore a new supply chain is suggested with the partial implement of JIT that is known as HYBRID SUPPLY CHAIN. It is the best alternative of JITSC if JIT is taken as centric point of discussion.

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