



RESEARCH ARTICLE

JIT Purchasing in Indian Service Sector

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Due to rapid developments in information technology, globalization, changing customer needs/preferences, and the changes in relative wealth between the developed and newly developing economies, the effective management of service systems addressing productivity, cost and quality issues has become important in the coming years. The management and marketing systems in services sector continue to suffer from lack of adequate systemization. The techniques for effective service operations management are not fully developed as in manufacturing. Materials management is one of the most important area in many service industries like railways, airways, telecommunication, roadways etc. on which the performance of these industries depend. JIT purchasing concepts have demonstrated their usefulness in Indian manufacturing industries and have the potential for quality improvement and cost saving. The purpose of this paper is to explore the relevance of JIT purchasing concepts in materials management of service sector. On the basis of preliminary relevant literature survey, it has been suggested to apply JIT purchasing concepts in service sector. A research methodology to carry out future work in this area is being proposed. In the end, some concluding observations are given.

Keywords: *JIT, Purchasing, Problems, Service sector.***Introduction**

Service sector of Indian economy is growing very fast but poorly managed. Service industries in India are looking for some innovative approaches to improve the performance of their services. Materials management is one largest area in many service systems which alone can help in improving the performance of service systems. Japanese “Just-in-time” (JIT) approach is suggested here as it reduces cost in all areas by the elimination of waste using common sense. It describes waste as anything that not necessary for the manufacturing of a product or is in excess. Anything that does not add value to product is classified as waste. It is also a drive to simplify the manufacturing process in order to quickly detect the problems and force immediate solutions. JIT is an approach which is demand driven and encourages flow type production. It greatly reduces lead time and work in process. It produces perfect quality with minimized unit cost and

is organized so that suppliers are dealt with positively in a win-win relationship rather than traditional adversarial one. JIT can be applied in all areas of manufacturing system such as total quality management, engineering design, set up time and lot size reduction, purchasing flexibility, supplier management, product development, inventory reduction at every stage, marketing and lead time reduction. Mostly all service systems consist of all these areas. Therefore, JIT concepts can be applied to service systems as well. In some service industries, the material cost is responsible for majority of the total cost in providing the services. Though materials management is the most important component in some service systems, it is poorly managed. The purpose of this paper is to explore the potential of JIT purchasing concepts in materials management of service organizations in Indian conditions.

Literature Review

Garg & Deshmukh [1] reviewed and classified the literature on JIT purchasing. The literature was reviewed and classified as conceptual articles, survey, case studies, and empirical/modeling work. The relative importance of JIT purchasing attributes had been identified. A survey of the attributes was carried out in Indian context. Attributes of high quality, mutual trust and cooperative relationship, reliable delivery, increased customer and supplier's support was among the attributes that were given a very high importance by Indian industries. This study had also predicted a better scope of JIT implementation in India compared to an earlier study [2]. The results of a case study in JIT implementation of an Indian tractor assembly were presented in this paper. Significant benefits were achieved by reductions in inventory, material movement, space, manpower, work-in-process and lead-time and an increase in productivity and quality as a result of JIT purchasing implementation. The key steps in implementation were: extensive training of employees on pull concept, identification of key performance parameters; new layouts based on U-shaped cells, standardization of operations, a maintenance plan for each machine, housekeeping, visual control and multiskill training. It has also been found that most of the identified JIT purchasing attributes were given strong emphasis. According to Radovilsky et al. [3] using JIT philosophy in purchasing yields a number of positive results in manufacturing and service organizations. The primary areas of improvement according to survey include inventory reduction, increased quality, and an overall reduction in total costs. Relationships with the suppliers and their support are the major focal point in running JIT purchasing system. The lack of coordination between departments inside the company was identified as another major problem in JIT purchasing. The lack of incentives appeared to be another problem in using JIT purchasing. Materials management area is said to be potential area of improvement in maintenance operations [4-6]. Maintenance inventory traditionally consists of items known as MRO goods. MRO goods are those

purchased for use in maintenance. To achieve an effective and planned maintenance program, a properly controlled maintenance inventory system is required. A successful JIT program will help in the management of maintenance inventory. A lot of studies [7-13] have suggested to apply JIT principles in the management of hospital inventory. Study [14] has suggested applying JIT purchasing concepts in the engineering purchase division of a large telecommunication firm who is in the business of providing telecommunication services. Inman and Mehra [15] studied the process of JIT implementation in a small package company in the air cargo industry. The company was retaining an inventory of quasi-MRO goods (shipping airbills, sorting bags, tubes, and employee uniforms). While utilizing an EOQ/ MRP inventory system, company saw their inventory investment swell from \$ 16 million to \$34 million. Company although a service industry looked for alternate techniques, such as JIT, to manage materials in their operation. Prem Vrat et al. [] have identified problems in JIT implementation in Indian context. These included poor quality of incoming material, non-receipt of delivery by buyer of exact quantity on exact time, little workers' motivation, unreliable transportation system etc. The Delphi study carried out by Prem Vrat et al. [15] indicated the JIT index to be 23.38 on a 40 point (0-40) scale, implying that though quite difficult, JIT implementation in India is possible. It may take 10-20 years for JIT to be fully implemented in Indian industries. It further stated that in order to become competitive, the Indian industry can't ignore the idea of JIT. The study also indicated that attention must be focused on poka yoke inspection methods, reduced setup times, 100 % quality of incoming material, kanban system, delivery by the vendor of exact quantity on exact time to achieve the results. Worker motivation and literacy need to be increased. Mahadevan [16] through survey investigated how far the Indian companies they are ready for Just-in-Time. Findings suggest TQM and vendor development efforts precede the launch of major JIT programmes. Automobile

Industry in the country has made significant improvements in areas such as multi-skilling of work force, setup time reduction and small lot sizes. TQM, TPM, and JIT purchasing constitute the basic requirements for successful JIT implementation. It has also been suggested that JIT and TQM must go together. JIT provides an organizational frame work for the exposure of waste and problems, TQM provide and organizational framework to solve these problems. The author is of the view that Indian companies are slow in exploiting the far reaching effects of JIT implementation. The Indian service sector suffers from high degree of variation in environment due to management style and accordingly different types of problems are expected

JIT Purchasing

JIT purchasing now a days is not being used only as a part of JIT systems but also as an independent purchasing system. In JIT purchasing environment, purchase is carried out in small lots in small standard containers used to hold exact quantity and to the required specifications from a nearby located single supplier with a long term contract. No reject from supplier is tolerated at any cost. The supplier is encouraged to be more innovative and understandable about benefits of JIT purchasing. He is given loose specifications. The company relies more on performance specifications than on the product design. Delivery schedule is left to the supplier. Counting and receiving inspection of incoming material is eliminated. Formal paper work is reduced to minimum. Delivery time and quantity level can be changed by simple methods. Supplier is evaluated by consistence in quality, delivery performance and price. Consistencies in quality and delivery performance under varying operating conditions are the most important factors. JIT purchasing practices in Japan are characterized by

- Purchasing in small lots with frequent deliveries
- Local single supplier located close to buyer's plant.

- Suppliers are considered long term partners with buying company
- Emphasis on quality, delivery, performance, and price.
- Elimination of counting and inspection of incoming material.
- Delivery schedule is left to buyer.
- Loose specifications
- Small standard containers
- Less paper work

The greatest benefit of JIT purchasing program is a reduction in inventory investment and related carrying costs. Other benefits include reduced paper work through the use of verbal or computer releases, shorter lead times through improved communication of needs and more time for the pursuit of purchasing projects as a result of fewer quality and delivery problems.

JIT Purchasing in Service Sector

Specifically, how would JIT purchasing be different in an operation that provides services rather than producing parts? This issue is perhaps best addressed by analyzing the major characteristics of JIT in a manufacturing operation, and then comparing them with service environment. The overall objectives of JIT remain unchanged, and operation requires the participation and cooperation of all functional groups in both environments. Additionally, the output of a quality product or service is the desired end product in both the cases. Long cycle times are problems for both manufacturers and service providers. However source of problem is different. Manufacturing firms face the problems of reducing cycle times for the processing or fabricating of the products produced. In the service environment, cycle time-both long and short- involve information flow i.e. flow from customer, through marketing, to engineering, to purchasing, to suppliers, and then to final service. Thus the good working relations between purchasing and engineering are important for the achievement of cycle time reductions. Other differences between the two environments are noted in storage, labor requirements, and types of purchases. Storage facilities in service environments are warehouses

containing finished goods and components for providing service. In manufacturing, JIT emphasis is primarily on the incoming material and subassembly storerooms. In case of a typically manufacturing firm labor is not coordinated through purchasing. In this case, extensive coordination of material and labor requirements may be required. Finally, a majority of the materials purchased by the average manufacturing firm tend to be relatively stable, and modifications can be made as product design changes. The service firms may on the other hand may face rapid rate of technological changes in its purchased materials. This rate of change may make accurate forecasting of the material required for future difficult [17].

Problem Areas of JIT Purchasing in Indian Environment

Initially, applications of JIT purchasing in United States were not very encouraging. The reason was lack of dedication on part of management and workers. Results were not found good in Italy, United Kingdom and Korea due to one reason or another, when JIT was attempted in their respective departments [10]. So it is essential to analyze the expected problems in the implementation of JIT purchasing in Indian service environments. Some of them are listed below.

Management Problems

The key problems of management are related to vendor selection, their development and evaluation. Vendors some times are reluctant to change their way of working. Vendors do not like to invest. Design of good evaluation system and establishment of long term contract are other problems. The concept of single supplier is not encouraged by purchasing personnel. Workers also resist change. Management do not find much time for innovation. Some parts are imported and it is difficult to reduce lead time.

Problems of Purchasing Personnel

Management implements the concept half heartedly and a strong commitment is lacking. They are reluctant investing money

in training of workers. Engineering changes are communicated late to them. People usually are not informed what others in the chain are doing. Sometimes personnel are overloaded. Lack of training in understanding the entire system of JIT purchasing is another problem.

Vendors Problems

Transportation system in India is not very reliable. Reducing lead time is vendor's biggest problem. Vendors may themselves be purchasing raw material from their sub suppliers and find it difficult to reduce the lead time. Companies or customers often do not listen their problems. They provide erratic delivery which may result in scheduling problems. Sometimes, vendors are associating with many companies and find it difficult to justify their responsibilities.

Environmental and Miscellaneous Problems

Mostly the problems arise due to the lack of team approach. There is poor communication and information flow. Company wants to pay vendor the minimum and vendor intends to extract maximum. Suppliers are not clear about JIT purchasing system. Culture of short term planning is dominating.

Research Methodology

It has been suggested above to apply JIT purchasing concepts in Indian service environments in spite of certain problems in Indian conditions. The above study is mostly based on literature review and is very conceptual in nature. So there is a need for detailed study in this regard. In this section, a research methodology is proposed. It is proposed to carry out study by following means

- Literature Review
- Data Collection
- Model Development, Validation and Interpretation
- Case study

Literature Review

The previous published work through journals, books will be studied and feasibility of implementation of conclusions

drawn will be carried out. The literature will be suitably classified. The problem will be diagnosed and solutions will be suggested in Indian context.

Data Collection

The data and necessary instruction to be collected will have following approaches, Questionnaire to collect the relevant data in areas of company description, logistics details, vendor related factors like vendor selection, vendor relations, development and evaluation of vendors, quality inspection of incoming material, benefits of JIT purchasing, implementation problems and pre-requisite variables required for successful implementation. Interviews with concerned management professionals like purchasing, production and quality control managers, engineering and design people, and managers responsible for managing logistics to get useful insights. Documents collection from companies and professional associations which are engaged in JIT and JIT purchasing efforts.

Model Development, Validation and Interpretation

References

1. Garg, Dixit, Deshmukh, SG (1999) JIT purchasing: Literature review and implications for Indian industry. *Production Planning & Control* 10(3):276-85.
2. Prem Vrat, Mittal S, Tyagi K (1993) Implementation of JIT in Indian environment: A Delphi study. *Productivity* 34(2):251-6.
3. Radovilsky Z, Gotcher W, Mistry R., Yip R. (1996) JIT Purchasing: Analyzing Survey Results. *Industrial Management* p. 17-21.
4. Benson Randall J (1986) JIT: Not just For the Factory! *APICS 29th Annual International Conference Proceedings*, pp. 370-4.
5. Claire FV (1986) The weakest link? JIT and maintenance management, *Production and Inventory Management Review with APICS News*, p. 36-45.
6. Jorge S Adib (2001) TOC, JIT, and maintenance management systems: What do they have in common?, *International Conference Proceedings, 2001 APICS- The Education Society for Resource Management*, p. 1-5.
7. Berling RJ can cut and Geppi JJ (1989) Hospitals materials cost by managing supply Pipeline. *J. the Health Care Financial Management Association* 43(4):19-26.
8. DeJohn P (1998) New materials specialists add personal touch to supply chain. *Hospitals Materials Management* 23(6):1&13.
9. Griesler DS, Aggarwal SC, as cited in Giunipero LC, Stepina L (1987) Job status and satisfaction of hospital material managers. *Hospitals Material Management Quarterly* 8(3):66-75.
10. La Plante A (1992) Inventory solutions from Henry Ford's day is just as valid today, *Evanston Hospital Corp.'s use of just-in-time inventory management techniques*. *InfoWorld* 14(47):52.
11. Lynch Dorene (1991) Just-in-time and stockless programs for hospitals: Fad or Trend? *Hospitals Materials Management Quarterly*.
12. Noorda Roger W (2002) Professional paper: Lake Mead Hospital Conversion to Complete Delivery System, Masters degree in Public

The data and information collected will be analyzed and appropriate model developed under JIT conditions. In this work, the sole purpose is to quantify the benefits of reduction in idle inventory, improved input quality, frequent deliveries in small quantities and reduction in buy in costs through long term contracts through a suitable modelling framework.

Case Study

At least one in-depth case study may be carried out.

Concluding Remarks

It is very well documented about JIT purchasing concepts in manufacturing industries. Some studies done in Indian context are also positive about the outcome of JIT purchasing concepts. Some problems have also been pointed out. There is very less work on the applications of JIT purchasing in service environments. Only few conceptual studies have been reported. This paper is also an attempt in this regard. Further studies are needed to expand the base of information in this field. A detailed research methodology to accomplish such a task is being proposed.

- Administration University of Nevada Las Vegas, p. 1-28.
14. Giunipero L, Keiser E (1987) JIT purchasing in a non-manufacturing environment: A case study. *J. Purchasing and Material Management* 19-25.
15. Inman RA, Mehra S (1991) JIT applications for service environments. *Production and Inventory Management Journal* 32(3):16-21.
13. Whitson D (1997) Applying JIT systems in health care, *IIE solutions*, p. 33-37.
16. Mahadevan B (1997) Are Indian Companies ready for Just-in-Time? *Management Review* p. 85-92
17. Korgaonker MG (1992) *Just In Time manufacturing*, Macmillan India Limited.