

# Implementation of JIT in industries- A Case Study

Tom Jose V, Sijo M T, Praveen

**Abstract—** Today in this new era, the basis of competition between the industries is time-based. This means that the focus is on reducing lead time by responding more quickly to customer demand for existing products. JIT II concept is a supplier's representative works full-time in a customer firm while being paid by the supplier. JIT II is based on customer-supplier concept and introduced by Bose Corporation. The paper is to study the effectiveness of JIT II in the purchasing, logistics, concurrent engineering, inter-organizational relationships and other business processes through case studies.

**Index Terms—**Bose Corporation , Customer, JIT II, Supplier, Bose Corporation.

## I. INTRODUCTION

Just-in-time (JIT), as an operational philosophy, has been of great interest to manufacturers and researchers alike over the past decade. Toyota Motor Company is credited with developing and operating the approach. With increased globalization, firms now faced intense competition from the world. Under such circumstances, there is an increased need to reduce cost and increase productivity. As such, firms are constantly seeking out strategies and management styles that may enable them to gain a competitive advantage over their competitors. One of the prominent, successful strategies is to implement the Just-in-time (JIT) system. JIT is a management philosophy that strives to eliminate sources of manufacturing waste by producing the right parts in the right place and at the right time. By establishing flow processes through the linkage of work centers, the objective is to create an even, balanced flow of materials through the production process. It helps to improve profits by reducing inventory levels and reducing unnecessary inventory related costs.

## II. LITERATURE REVIEW

JIT II, a customer-supplier partnership concept pioneered at Bose Corporation and now practiced by major companies and their suppliers, can aid in cutting both cost and response lead time. In a JIT II - A supplier's sales representative works

full-time in a customer firm while being paid by the supplier. The customer serves as the host organization, and the supplier representative-referred to as an in-plant representative, "in-plant" or "reps" functions as an employee of the customer's purchasing department, attending planning meetings and determining material needs. The in-plant is then authorized to purchase materials from the supplier for the customer.

### A. Reason for Developing JIT II

In the early 1980's, shortly after Lance Dixon had been hired by Bose, he requested that Corporate Procurement's budget be increased significantly to add more experienced buyers, upgrade the department's information systems, and develop global sourcing programs. As the company grew, Dixon found that every year he needed more people in procurement, and every year at budget time he fought with management over staffing levels but his request was turned down because company resources were focused on efforts in Japan.. Dixon developed an alternative solution to put purchasing at its "profit centre mode". As Dixon said, "I can get the people I need to do the job and not add anything to payroll". In 1990, Dixon proposed to change the relationship between Bose and certain vendors under a program he called "JIT II". Under JIT II, a vendor representative (the "rep") would replace the vendor salesperson, the Bose buyer, and the Bose materials planner and would be authorized to decide what, when, and how much to order for a particular range of products or services. Reps would determine order quantities and placing orders to their companies. Reps would also provide engineering expertise in their commodity area and help to solve problems on the production floor. The reps would be stationed full-time at a Bose facility and would be empowered to use the Bose computer systems, but would be hired, evaluated, and paid by the vendor.

### B. Implications of JIT II

With JIT II, the benefits are enhanced and additional benefits are gained as a direct result of the nature of the partnership. Because the supplier representatives are full-time employees of their customers, they have ready access to information that can be used to reduce lead times. This close working relationship has influenced :

- (1) The administration of the purchasing function,
- (2) Logistics,
- (3) Concurrent engineering,
- (4) Better inter-organizational relationship.

"It's a fresh, non-traditional relationship based on trust. I'm a believer. It works," says Chris LaBonte, materials manager for G&F Industries. LaBonte was Bose's first supplier

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in-plant. He worked in an office at Bose, placing and signing off on purchase orders for his own company. At the same time, he says, an evolution takes place for the supplier: Customers make the suppliers faster and better than they would have been. Because of JIT II, says LaBonte, G&F's standard cost to Bose has stayed the same or declined over nine years without his company losing market share. There were questions how long a JIT II relationship would last in a company growing as rapidly as Bose.

### III. THEORETICAL FRAMEWORK

The new basis of competition in many industries is time-based. This means that the focus is on reducing lead time by speeding up the design of new products or responding more quickly to customer demand for existing products. JIT II, a customer-supplier partnership concept pioneered at Bose Corporation and now practiced by major companies and their suppliers, can aid in cutting both design and response lead time. This is done through system integration, a basic process strategy of time-based competition. The practice of JIT II links engineering, planning, and purchasing departments and bridges the inter-organization gap between customer and supplier [5].

In a JIT II relationship, a supplier's sales representative works full-time in a customer firm while being paid by the supplier. The customer serves as the host organization, and the supplier representative-referred to as an in-plant representative, or "in-plant" or "reps" functions as an employee of the customer's purchasing department, attending planning meetings and determining material needs. The in-plant is then authorized to purchase materials from the supplier for the customer.

With JIT II purchasing, the benefits are enhanced and additional benefits are gained as a direct result of the nature of the partnership. Because the supplier representatives are full-time employees of their customers, they have ready access to information that can be used to reduce lead times. This close working relationship has profoundly influenced

- (1) The administration of the purchasing function,
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- (4) Better inter-organizational relationship.

In each of these cases, the lead time reductions having an in-plant on-site provides the customer with continuous supplier support. Essentially, the supplier is always available and has a real-time awareness of customer needs. The levels of customer service and efficiency that are achieved are greater than those in firms where off-site representatives serve the account. The time required to contact a supplier is minimized because the in-plant attends the customer's production planning meetings, determines the material quantities needed from the supplier, and places orders on behalf of the customer. Necessary follow-up tasks, including order revisions, material delays, shortages, or quality problems, are also the in-plant's responsibility. With the customer's production planning information, the in-plant may even schedule the supplier's production of the customer's materials, linking the partners in the supply chain even more closely [2].

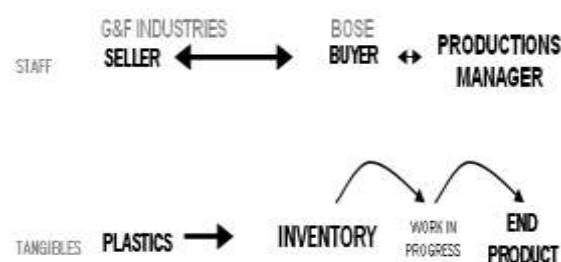
The practice of JIT II reduces administrative costs for both the customer and the supplier. The customer no longer

exclusively bears the costs of the purchasing function because the supplier pays the salary of the in-plant. The customer's regular purchasing staff is free to concentrate on non-JIT II suppliers. Similar administrative cost reductions are achieved by the supplier.

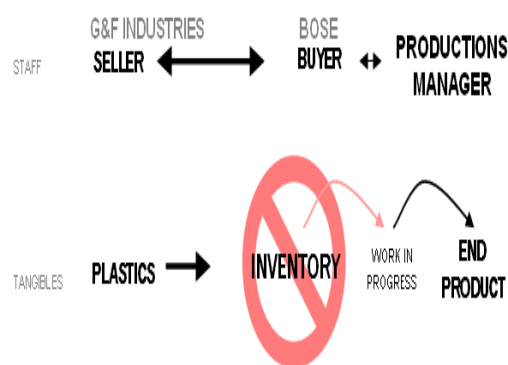
A JIT II partnership supports the use of electronic technology to reduce lead times by accessing information quickly and using the technology to communicate between customer and supplier. As JIT II partnerships mature, supplier representatives are allowed ongoing electronic access to the customer's material planning system and can arrange electronically for the delivery of material to the customer. This access further links the partners, and the amount of time gained with electronic communication can aid in getting materials from the supplier more quickly. Some supplier representatives are even authorized to initiate the payment process to their employers once goods have been received by the customer. This results in improved cash flow for the supplier [4].

### IV. SUPPLY CHAIN MANAGEMENT AT BOSE CASE STUDY

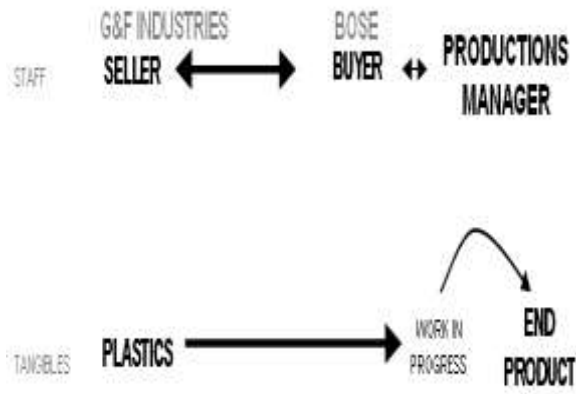
#### A. When JIT is Implemented at Bose



(Fig. 1)

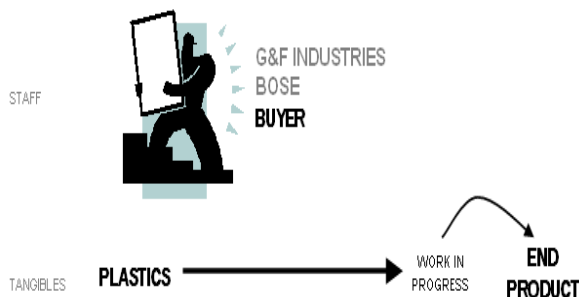


(Fig. 2)



(Fig. 3)

### B. Bose JIT II



(Fig. 4)

Twelve years later the JIT II experiment is still going strong. The United Printing in-plant still maintains an office in the Bose advertising department, with access to worldwide demands, constantly searching for efficiencies and cost reductions.

The in-plant also places orders with manufacturing, and processes all the paperwork. Because the standards are already set, the task becomes one of eliminating duplication and errors, and maintaining a seamless direct-to-stock flow of printed material to Bose plants around the world. Bose wants material when it is needed, not to sit in a warehouse. Responding to constantly changing production schedules without creating costly inventory, or even worse shutting down the line with late shipments, is United Printing's challenge.

Under the JIT II program, however, the process is simplified. After Bose forecasts customer demand, the in-plant checks every plant's inventory, combining and reducing unit costs for any other needs, then orders the product to ship direct-to-stock to the Bose location.

Issue : Early on in Bose – United printing relationship, Bose's Mexico plant had a spike in production. This demand called for the printing of \$45,000 worth of products in a very short time. Here was a great opportunity to make a buck! The inventory was almost zero. This was no time for competitive bidding or old school methods.

Steps taken: United Printing's in-plant went to work immediately, but not in the conventional sense. First, they searched the other plants' inventory to see what was readily

available. Then checked with the advertising department and found that the literature was going to be revised for the next printing. This told united printing that if they print the ordered product, it would be obsolete in three weeks. But, knowing this did not negate the need for Mexico's production now.

*Solution:* The in-plant was able to borrow enough stock from Bose's Ireland plant to keep Mexico going. This was accomplished with the help of Bose Fleet, which is arranged by the logistics.

*Benefits:* Bose did not spend \$45,000 for product. The production line did not shut down. The product was revised. At the time of the new printing, the borrowed product was replaced with the new version at a lower unit cost because all demands were included in this production run.

Because the supplier representative is always available, JIT II permits concurrent engineering to take place on an on-going basis. The in-plant's full-time position in the customer firm keeps the supplier informed of the customer's future material needs, while the customer's design engineers are informed of the supplier's material and process capabilities. Such a close working relationship enables both the customer and supplier to act as consultants to each other. In particular, with regard to concurrent engineering, the customer and supplier can work together early in the design cycle of new products, allowing the supplier to develop the appropriate materials for the customer and sell directly to the customer's engineers. Researchers have concluded that nearly 70 percent of the cost of a product is determined during its design. Thus, when concurrent engineering is initiated early in the design, better products are developed in less time and at lower cost.

JIT II concurrent engineering can also smooth the transition from design to manufacturing. Once a product moves beyond the prototype stage and is ready to be manufactured at an assigned plant, the supplier representative, who has been involved in developing new materials for the product, can assist in the start-up of manufacturing the product at that plant. As a part of JIT II, BOSE furnish in-plants with unprecedented access, resources and insights to Bose operations. For example, Bose gives in-plants a 24-hrs access card to Bose facilities, an office, the ability to log on to certain Bose's information system, and even allows them to print their own Bose business cards. In-plants can formally or informally meet with Bose's manufacturing, engineering and marketing teams and attend planning meetings. In exchange in-plants place orders for their firm's products at pre-specified standard prices, ensure that these parts are to be delivered at right time and at right place and in conformance to specifications, and to provide trouble-shooting assistance. With JIT II, suppliers work hand-in-hand with customers, acting more like partners than traditional buyers and sellers. JIT II arrangements call for the supplier's on-site representative to monitor the buyer's inventory and be responsible for keeping it replenished-including placing orders on his or her own authority. Lance Dixon calls this "empowerment of the supplier within the customer's organization" and says it is the major innovation in JIT II from which numerous benefits flow. JIT II allows customers and suppliers to work together closer than they ever did before.

*B. The Management of JIT II: Case Study*

Dixon felt that vendor representatives should be treated, in every respect, as Bose employees- to be listed in Bose telephone directories and have access to all Bose facilities, people, and computer systems.

Issue: Neither Beeson nor Dixon was sure that vendors would be interested in participating in JIT II. A qualified rep might cost the vendor \$80,000 per year (fully loaded). Dixon and Beeson planned to approach United after they knew whether G&F would participate. Even if G&F did agree to participate, several issues remained to be resolved. However, several Bose managers had voiced concerns about this arrangement. Some felt that certain information, such as quantities and prices of parts bought from other vendors, should remain confidential-at least to provide an advantage during negotiations.

Steps taken: In the past, vendor's representatives had typically worn badges that identified them as vendors, and were permitted access only to approved locations within Bose facilities. Dixon proposed changing the policy, he advocated that the reps for JIT II vendors are issued badges just like Bose employees and be free to come and go as they close [6].

There was also debate about how to ensure that vendors supplied goods at fair prices over the course relationship. Dixon felt that the company's previous purchases in a given category provided experience to evaluate vendor prices, but others argued that inflation or changes in raw material prices could quickly render this information obsolete.

Result: Finally, Dixon started the program with G&F and United in informal criteria for determining when and with whom to establish JIT II relationships. There were questions how long a JIT II relationship would last in a company growing as rapidly as Bose.

#### IV. RESULTS AND DISCUSSION

By studying various case studies in this project, I came to a conclusion that JIT II benefits both the supplier and customer (BOSE).

Benefits to supplier: Through JIT II, supplier increases their share of Bose business, Improve their profitability, Develop new products.

Benefits to Bose: Bose gains full time purchasing, production planning, and order fulfilment personnel at no charge, Gets lower ordering processing, inventory handling, and delivery cost, In-plants are continuously involved in cost reduction, quality improvement and value analysis.

#### REFERENCES

- [1] Akao, Yoji, "Quality Function Deployment. Productivity Press. Cambridge", pp. 369 . 1990
- [2] J Anon.. Les échanges de données informatisées et l'amélioration de la qualité dans la filiere construction. Plan Construction et Architecture. Paris. 133 p. 1991
- [3] Ayres, Robert U, "Complexity, Reliability, and Design: Manufacturing Implications"; Manufacturing Review, Vol. 1, pp. 26 – 35 , March 1988,
- [4] Ashton, J.E. & Cook, F.X. Jr.. "Time to Reform Job Shop Manufacturing". Harvard Business Review., pp. 106 – 111,1989.

- [5] Gilbert J.P, "The State of JIT Implementation and Development in the USA". International Journal of Production Research. Vol.28 No.6, Pp.1099-1109, 2000.
- [6] Krupka, Dan C, "Time as a Primary System Metric". National Academy Press, Washington, DC.Pp. 166 - 172,1992
- [7] Schonberger, Richard J, "Building a chain of customers". The Free Press, New York. 349 p. 1999

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