Just-in-Time (JIT): Growing Acceptance across Sectors

Bhupesh Lohar, Research Scholar, University College of Commerce and Management Studies

Abstract

In Today’s competitive environment, where the profit margins are shrinking, most companies in the world are working on their inventory management techniques. Companies are working on logistics and supply chain management, just-in-time management to cut down inventory holding costs, and at the same time, are ensuring that there are no inventory failures or stock outs. One of the management techniques which are gathering momentum across different industries and sectors is just-in-time inventory management.

This article, based on reviews of literature, presents an insight into one of the few but significant drawbacks of just-in-time (JIT). JIT has been widely adopted in Indian automobile manufacturing Industry. But, the auto manufacturers have faced problems due to lack of a proper support system. The article describes how the auto manufacturers have taken precautionary steps to deal with the situation to gain maximum returns from the implementation of JIT.

Learning objectives of the article:

1. Define and explain the concept of just in time manufacturing and inventory control system?
2. What are the advantages of implementation of JIT?

Introduction:

Traditionally manufacturers have forecasted demand for their products into the future and then have attempted to smooth out production to meet that forecasted demand. At the same time, they have also attempted to keep everyone as busy as possible producing output so as to maximize "efficiency" and (hopefully) reduce costs. Unfortunately, this approach has a number of major drawbacks including large inventories, long production times, high defect rates, production obsolescence, inability to meet delivery schedules, and (ironically) high costs. None of this is obvious-if it were, companies would long ago have abandoned this approach.

Managers at Toyota are credited with the insight that an entirely new approach, called just in time (JIT) was needed.

- Definition of Just in time manufacturing
- Just-In-Time concept in auto manufacturers
- Benefits / Advantages of just in time manufacturing Implementation system
- Limitations / Disadvantages of Just in Time Manufacturing Implementation.
- List of Companies that use Just in Time systems.

Definition and Explanation of Just in Time Manufacturing:

Just in Time (JIT) is a production and inventory control system in which materials are purchased and units are produced only as needed to meet actual customer demand. When Companies use Just in Time (JIT) manufacturing and inventory control system, they purchase materials and produce units only as needed to meet actual customers demand. In just in time manufacturing system inventories are reduced to the minimum and in some cases is zero. JIT approach can be used in both manufacturing and merchandising companies. It has the most profound effects, however, on the operations of manufacturing companies which maintain three class of inventories-raw material, work in process, and finished goods. Traditionally, manufacturing companies have maintained large amounts of all three types of inventories to act as buffers so that operations can proceed smoothly even if there are unanticipated disruptions. Raw materials inventories provide insurance in case suppliers are late with deliveries. Work in process inventories are maintained in case a work station is unable to operate due to a breakdown or other reason. Finished goods inventories are maintained to accommodate unanticipated fluctuations in demand. While these inventories provide buffers against unforeseen events, they have a cost. In addition to the money tied up in the inventories, expert argue that the presence of inventories encourages inefficient and sloppy work, results in too many defects, and dramatically increase the amount of time required to complete a product.

Just-in-Time Concept in Auto Manufacturers:

Under ideal conditions a company operating at JIT manufacturing system would purchase only enough materials each day to meet that day's needs. Moreover, the company would have no goods still in process at the end of the day, and all goods completed during the day would have been shipped immediately to customers. As this sequence suggests, "just-in-time" means that raw materials are received just in time to go into production, manufacturing parts are completed just in time to be assembled into products, and products are completed just in time to be shipped to customers.

The Indian automobile component manufacturing industry has over the years grown into a major supplier in international markets. Indian auto manufacturing companies have the advantages of low-cost of production, high quality products, and a good supply chain. This, over a period of time, led to the rise in their popularity among foreign auto-
manufacturers. According to SIAM,¹ in 2004, the Indian automobile industry grew by 54%, exports in auto ancillaries grew by 29%, and exports of auto components rose 32% to $1 bn compared to 2003.² 

Before the mid-1990s, Indian auto manufacturers focused primarily on exporting auto components to foreign automobile manufacturers. The focus was on core issues such as vendors, product quality and marketing. As strong car manufacturers entered India, following the new automobiles policy of the government of India, the Indian automotive industry began to focus and fine-tune manufacturing and supply chain operations, and adopt new technologies to improve processes and products. Other initiatives included the implementation of concepts like Just-in-Time (JIT) manufacturing, mass customization, zero error production, and reduced cycle time to meet the export requirements of global customers.

Although few companies have been able to reach this ideal, many companies have been able to reduce inventories only to a fraction of their previous level. The result has been a substantial reduction in ordering and warehousing costs, and much more efficient and effective operations. In a just in time environment, the flow of goods is controlled by a pull approach. The pull approach can be explained as follows. At the final assembly stage a signal is sent to the preceding work station as to the exact amount of parts and materials that would be needed over the next few hours to assemble products to fill customer orders, and only that amount of materials and parts is provided. The same signal is sent back to each preceding workstation so a smooth flow of parts and materials is maintained with no appreciable inventory buildup at any point. Thus all workstations respond to the pull exerted by the final assembly stage, which in turn respond to customer orders. As one worker explained, "Under just in time system you don't produce anything, anywhere, for anybody unless they ask for it somewhere downstream. Inventories are evil that we are taught to avoid". 

The pull approach described above can be contrasted to the push approach used in conventional manufacturing system. In conventional system, when a workstation completes its work, the partially completed goods are pushed forward to the next work station regardless of whether that workstation is ready to receive them. The result is an unintentional stockpiling of partially completed goods that may not be completed for days or even weeks. This ties up funds and also results in operating inefficiencies. For one thing, it becomes very difficult to keep track of where everything is when so much is scattered all over the factory floor.

Another characteristics of conventional manufacturing system is an emphasize on "keeping every one busy" as an end on itself. This inevitably leads to excess inventories particularly work in process inventories. In Just in time manufacturing, the traditional emphasize of keeping everyone busy is abandoned in favor of producing only what customers actually want. Even if that means some workers are idle.

Benefits / Advantages of Just-in-Time Manufacturing Implementation System in Auto Industry:

The main benefits of just in time manufacturing system are the following:

1. Funds that were tied up in inventories can be used elsewhere.
2. Areas previously used, to store inventories can be used for other more productive uses.
3. Throughput time is reduced, resulting in greater potential output and quicker response to customers.
4. Defect rates are reduced, resulting in less waste and greater customer satisfaction.

As a result of advantages such as those cited above, more companies are embracing just in time manufacturing system each year. Most companies find, however, that simply reducing inventories is not enough. To remain competitive in an ever changing and ever competitive business environment, must strive for continuous improvement.

Dell Computer Corporation has finally tuned its Just-in-Time system so that an order for a customized personal computer that comes in over the internet at 9 A.M. Can be on a delivery truck to the customer by 9 P.M. In addition, Dell’s low cost production system allows it to under price its rivals by 10% to 15%. This combination has made Dell the envy of the personal computer industry and has enabled the company to grow at five times the industry rate. How does the company’s Just-in-Time system deliver lower costs? “While machines from Compaq and IBM can languish on dealer shelves for two months Dell does not start ordering components and assembling computers until an order is booked. That may sound like no biggie, but the price of the PC parts can fall rapidly if orders were to fall in just a few months. By ordering right before assembly, Dell figures its parts, on average, are 60 days newer than those in an IBM or Compaq machine sold at the same time. That can translate into a 6% profit advantage in components alone.

American Standards uses cell manufacturing to cut inventories and reduce manufacturing time. At its plant, England, it used to take as long as three weeks to manufacture a vacuum pump and another week to process the paper work for an order. Therefore customers had to

¹ Society of Indian Automobile Manufacturers represents most of the leading vehicle and vehicular engine manufacturers in India.

² “RFID in the Automotive Industry: The Road Ahead”,
place orders in advance.” Today Leeds has switched to manufacturing cells that do every thing from lathing to assembly in quick sequence. The result is a breakthrough in speed. Manufacturing a pump now takes six minutes.”

Limitations / Disadvantages of Just in Time Manufacturing Implementation:

General Motors Corp. (GM) was one of the many auto majors operating in India that implemented JIT. In 2004, when Gujarat was hit by floods, though GM’s at Halol\(^3\) was not affected by floods, production was stopped because the trucks carrying essential supplies for production could not reach the factory. GM’s\(^4\) production was severely disrupted. According to General Motors India, President and MD, Aditya Vij, “Our Just-in-Time (JIT) supplies were impacted due to the strike and floods in some areas, which led to production being hit by 15-20%.”\(^5\) After this incident, GM reduced its dependence on just-in-time supplies and began to keep a buffer inventory for a period of about 15 days to allow some relief during calamities, the company decided to source its crucial component parts from than one supplier.

Hyundai Motor Company (Hyundai)\(^6\) also had a Just-in-Time system in place at its manufacturing facilities. The level of feasibility and dependability on JIT was once again under question when the transport strike in 2004 forced Hyundai to postpone the launch of Getz.

Maruti Udyog Limited (MUL)\(^7\) faced a similar problem when a transport strike combined with heavy rainfall and floods, forced it to airlift vital components from Pune (Maharashtra) to its major production facilities in order to maintain production.\(^8\)

The Mumbai floods in mid-2005 created major disruptions in the supply of raw materials for auto companies like M&M,\(^9\) Tata Motors\(^10\) and Daimler Chrysler\(^11\). The nationwide strike called due to the implementation of Value-Added Tax (VAT) also disrupted the supply chain in early 2005 and created questions as to the extent to which Indian manufacturers could reap benefits from the JIT system.

The strike at the Hero Honda Motors Limited’s (Hero Honda) factory in April 2006 was another instance when excess dependence on Just-in-Time came to the fore. The five-day strike at the Hero Honda’s Gurgaon facility brought production from 5800 motorcycles per day to a complete standstill. Since the strike involved irregular workers, the company was unable to stock the inventory beforehand. Hero Honda already had an existing Supplier Relationship Management (SRM) system using SAP for faster information exchange and more streamlined operations for JIT deliveries. Despite this, the production loss could not be avoided.

Conclusion:

Calamities like floods, labour problems or supply chain disruptions like strikes have forced auto manufacturers to re-examine their excessive dependence on JIT. Some auto analysis and consultants explained that JIT is not meant to take the blame when an inefficient supply chain develops snags. Besides, globally auto companies have saved billions of dollars using JIT supply management. Manish Mathura of AT Kearney said “JIT is certainly one of the best practices in any production system but you need to have supply chains streamlined for it. You need maturity in the supply chain to make JIT successful because no company can hold an infinite amount of inventory expecting these one-off events.”

Auto manufacturers are looking for complementary techniques and processes that can enable JIT to work more reliably. As an effort in this direction, auto manufactures have started relying on information technology to manage supply chain processes. Radio frequency Identification (RFID) technology is being introduced in many facilities and companies realize that JIT cannot be implemented unilaterally.

List of Companies that use Just in Time (JIT):

- Harley Davidson

\(^{3}\) An industrial town in the Indian state of Gujarat.

\(^{4}\) US-based automobile company.

\(^{5}\) http://www.indiacar.net/news/n7127.html

\(^{6}\) It is a leading four-wheeler automobile manufacturer in South Asia.

\(^{7}\) Maruti Udyog Plant has three fully integrated production facilities spreading over 297 acres of land. Its Gurgaon Plant is the most important of the three.

\(^{8}\) Mahindra & Mahindra Limited (M&M) is the flagship company of US$2.59 bn Mahindra Group. It was set up in 1945.

\(^{9}\) Established in 1945, Tata Motors is India’s largest automobile company.

\(^{10}\) It is a US-German venture that manufacturers light commercial vehicles like Mercedes-Benz, Jeep and Dodge.

\(^{11}\) An indirect tax that is levied at the time of the sale of goods and services.
Other References:
5. www.adpunch.org
6. www.awrt.org
7. www.campaignforrealbeauty.com
8. www.dove.com
9. www.effie.org
10. www.wikipedia.com
12. www.sourcewatch.com
14. www.unilever.com