

# Literature review on jit and lean production



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BUSTER**

To keep a minimum level of inventory is called Just in time inventory system. Goods are available when we want to use the goods or when we want dispatch the goods.

Just in time is a philosophy of management. Just in time also means that the goods are according to the mind of customer in respect of quality, design, features, quantity etc.

JIT also mean t minimize the waste of the production. When we minimize the waste our cost of production will reduced and profit will increase.

### **History of Just in time inventory system:**

Just in time system of inventory introduced by Japan since 1971 in the manufacturing industries. Taiichi Ohno firstly successfully applied Just in time in Toyota plants.

### **Elements of JIT:**

Following are the some key elements of Just in time inventory system.

Reduce setup times

Reduce lot sizes

Reduce lead time

Preventive maintenance

Small lot conveyance

**i) Reduce setup times:**

The first element of JIT is to reduce the setup time. It can be achieved by changing the process, excellent planning and changing the design of the goods.

Here we code an example of car racing in which all the processes are managed excellently, processes are good designed and employees are changed four tires and engine oil just in few minutes in which we just change only one tire. It is an excellent example of reduce setup time.

**ii) Reduce lot sizes:**

When you reduce your setup time then your production in small units is economical. You should develop a strong relationship with your suppliers that they provide the goods in small lots frequently.

**Reduce lead time:**

Another element of JIT is to reduce the lead time of the inventory system. It can be achieved by developing a better relationship with your suppliers that they provide the goods when you required and should be in small quantity. We select the closer supplier of our factory which can reduce the lead time.

**Preventive maintenance:**

Another element of JIT is to preventive maintenance. We can achieve by employing the best machinery and workers on the job that they can prevent the breakdowns.

You always produce the "A" quality products by using the preventive measures because when some one do something wrong stop him/her at the spot which can help you to produced better quality products.

When you use preventive action you can reduce the cost of production by minimizing the waste and increase the profit of the organization.

### **v) Small lot conveyance:**

For the implementation of JIT we required the KANBAN system although the KANBAN system does not required the JIT. So another element of JIT is to small lot conveyance.

### **A cross functional diversity:**

Before we discusses the cross function diversity first we explain what diversity is?

### **Diversity:**

The difference and similarities between the employees, partners, customer, stakeholders and other person of the organization that have different culture, language, nature is called diversity. If we manage the diversity of the personal of an organization it will be very beneficial for the organization.

### **Cross Functional Diversity:**

It means there are different function in the organization that have some common and some different features. It means there is diversity of functions in the organization. If we manage this diversity we will achieve our goals easily.

Sometime we develop the cross functional teams to handle the cross function diversity. This team consist a large number of member from different department and having different abilities and expertise. They work together to mange the cross function diversity of the organization.

This cross functional team has power to handle the diversity of the functions of the organization. The success of a cross function team will depends upon the structure of the foundations.

Following are the list that what the come first in this process is?

To build the common goal and purpose of the cross functional team.

For the resolve of conflict of the cross functional team we establish the processes of conflict resolution.

Provided the structure of power that every person in the must know his or her role in the team and the leader of the team must perform act more than his her capacity.

Provided a structure to accountable the act of every member of the team. If the result of the team are bad because of someone mistake that person are individually account for his or her mistake.

The skills of the team members must be developed in the working of managing the cross functional diversity.

### **A cross Industries diversity:**

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**Cross Industries diversity:**

It means the group of different people who have different expertise belonging to different industries of the country.

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### **A cross Countries diversity:**

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### **Diversity:**

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### **Cross countries diversity:**

It means the group of different people who have different expertise belonging to different countries of the world.

Sometime we develop the cross functional teams to handle the cross countries diversity. This team consist a large number of member from different industries and having different abilities and expertise. They work together to manage the cross country diversity of the world.

This cross functional team has power to handle the diversity of the countries of the world. The success of a cross function team will depends upon the structure of the foundations.

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### **Pre-requisition of JIT:**

Following are the pre-requisition of JIT:

The first requirement of implementation of JIT philosophy that every department should have common goal. This goal supported the top management of the organization for the allocation of the resources to developing the JIT system of inventory.

The second requirement of the implementation of JIT inventory system is that the reasonable finance is available at early stages of implementation of JIT system. JIT system required reasonable finance for the implementation.



Management needs to come with grips during the early transition phase of implementing JIT. The prospect must be faced of some production loss and changes to management procedures and operation policies while existing operations and manufacturing problems are being concurrently resolved. Just-in-Time will require every department in a company to contribute to the overall success of the system and patience is required as results are not instantaneous. In the long term, the rewards are worth the initial setbacks.

Trust and commitment between the supplier and the customer is a must, and it is essential to keep these commitments as this is to ensure that customer's confidence in a supplier's ability to meet production schedules.

It is impossible to establish a new JIT system that can be used successfully without modification. Since each manufacturing process is different. It is up to the individual company to determine the degree of appropriateness and the final application of JIT. However, it is very important to define the plan and objectives before setting up a JIT manufacturing system.

### **Two case studies in which JIT was introduce:**

Following are the two cases in which the philosophy of JIT was implemented.

#### **Case study # 01:**

This case study is about the FORD KA company. It is a car manufacturing company. The company wants to improve in its previous product. It is a real example of implementation of the JIT management philosophy.

The company's production target is 1100 cars per day and the company completes this task with in eight weeks but fiesta required the fifteen weeks

to complete the target. The major reason of this delay was the high assembling time and material handling. The company was purchase the raw material from various suppliers, firstly it loaded in the trucks than reached the support it very risky process because there is lot of chances to damage the material, misplace etc.

By the implementation of the JIT philosophy, the quality of the product increased, minimized the lead time, quick response the demand of the customer especially inventory level minimized, high space is available, handling and storage cost minimized with high rate.

The company is known connected with the 50 suppliers who supply the heavy raw material like fuel tank and seats. When the company applied the DAD (direct automate delivery) the product are delivered when it actually required. By the implementation of DAD the components are assemble with in few time.

Following was the situation before the implementation of JIT philosophy.

There is 15 days required to complete the task.

There is 3000 parts are required for the assembling for each car.

There is small outsourcing the process of the company.

Trucks are used for the delivery of raw material from suppliers.

For the continually production company produced a lot of goods which increased the inventory level.

The most of the components are damaged during loading and handling.

The company incurs the \$6 million on the production of the products.

Overall automation is round about 80%.

Due to the incorrect placement of seat and battery people are injured.

The profits are not up to the mark.

### **Case study # 02:**

The second case study is about the Ambrake Corporation. Two world leaders in the design and manufacture of automotive brake components, Akebono Brake Industry Co., Ltd. of Japan and Delphi Automotive, formed a unique partnership and founded Ambrake Corporation to produce technologically advanced, high-quality precision brakes. Ambrake has been a success, reaping tremendous rewards from its efficient operations. It has maintained its position as a major force in the brake industry.

According to Mark Mahoney, Ambrake president, the three elements involved in JIT production are “ hardware,” “ software,” and “ Human ware.” The hardware element covers the physical aspects of the plant, including equipment design and cellular manufacturing.

The software focuses on product processing and systems, including material and information flow, pull systems, quick changeover, built-in quality, and workplace organization. Human ware, however, is the essential element that makes the organization operates it should.

## **Four Pillars of JIT Human ware:**

Several components are necessary to shape the human element in an organization so that JIT is a successful production philosophy. In general, the Human ware technology of JIT consists of four components: (1) education and training program, (2) development of a cooperative environment, (3) rewards and incentives program, and (4) open communication and worker involvement.

The company owes much of its success to the partnership between JIT and human resources. Since Ambrake's manufacturing philosophy is consistent with the Just-in-Time philosophy, most segments of its operation complement the ideas surrounding JIT.

## **7. Suggest various advantages that found in above case studies:**

Following are the list of advantages that are found in above two case studies.

### **Case study # 01:**

Following are the advantages that are found in case study number one on the FORD KA company.

1- After implementation of JIT the task which was completed in 15 weeks should be cover in 8 weeks.

2- The company assembles only round about 1200 parts. Remaining parts are assembled by the supplier.

3- The parts which are required the outsourced, will be outsourced.

- 4- Automatic delivery system are reduced the transport cost of the company.
- 5- There is very short inventory of stock.
- 6- The damaged units are reduced due to automatic delivery system.
- 7- The company saving the \$6 million in a year.
- 8- Still 80% automation is there.
- 9- Seats and battery are fixed at correct place with the help of automated machines.
- 10- The profit of the organization has been increased.

### **Case study # 02:**

Following are the advantages that are found in case study number one on the AMBRAKE CORPORATION.

JIT emphasizes superior organizational values and philosophies, long-term strategic goals, a two-way communication system, cooperation, harmonious relationships, functional structures, strong commitment and loyalty to the organization on the part of its members, and a consultative decision-making process.

It is important to emphasize that the success of JIT is not the result of cultural, structural, or environmental factors, but rather success stems from planned management actions. It is the discipline, understanding, dedication, confidence, and continuous striving for improvement that make JIT

successful. All of these qualities, which should be evident in every employee, can be engendered by proper human resource management.

The company continually develops the Ambrake production system (APS), which is modeled on the Toyota system. APS is the driving force in manufacturing, and it is how Ambrake defines work practice in the plant. Implementation of APS is a never-ending process: The Company is “ always looking for new ideas and special talents to maintain competitiveness” APS is designed to promote kaizen, the practice of continuous improvement. Kaizen helps to eliminate waste and, therefore, makes jobs easier and safer by eliminating anything that hinders work. The corporation’s aim, using truly efficient work methods to produce zero defects, is thereby achieved.

In summary, Ambrake’s manufacturing philosophy is based on three goals: flexibility, teamwork, and continuous improvement. By following a participative management style based on mutual respect, fairness, and trust, Ambrake is able to achieve these goals and create a truly “ open” atmosphere that makes Ambrake associates want to contribute. They help to provide the motivation for everyone to work together to achieve a common goal of excellence.