



LEAN MANUFACTURING Vs JUST IN TIME

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Abstract

Lean Manufacturing with Just in Time production (JIT), understanding the two concepts as they had the same meaning when Lean Manufacturing and JIT have a few similarities but are essentially different. While JIT is focused on making production processes more efficient, lean manufacturing cares about using efficiency to add value to products than can be recognized by customers, while reducing “muda” or waste along the manufacturing process. Sometimes Lean Manufacturing is dedicated to reducing JIT costs associated with transportation, warehousing and, packaging.

Introduction

Many confuse the concepts of Just In Time (JIT) and Lean Manufacturing. Scott Thompson, journalist for the Houston Chronicle outlines the differences between the two. Thompson writes, “Just-in-time manufacturing is focused on efficiency, while lean manufacturing is focused on using efficiency to add value for the customer. Just-in-time manufacturing can be practiced on its own or as one step in the lean manufacturing process.”

There are other ways JIT and Lean differ. Lean is a complete system that can be used across business departments including manufacturing, production, marketing, distribution, etc. You can use Lean to create a JIT process but JIT is the piece of the Lean method that eliminates the waste of excessive inventory.

JIT and **Lean manufacturing** have an interesting history based on the auto industry. Before the JIT concept, manufacturers created their products in surplus and often, well in advance of need. Henry Ford implemented JIT at a plant in Michigan. Iron ore was delivered on Monday and was



part of a finished car three days later. Ford saw the savings in having just the right amount of inventory arriving at just the right time.

Ford's work influenced Taiichi Ohno, a Toyota executive who studied the manufacturing process of the Model T. Ohno was also impressed with American supermarkets and how they stocked inventory. He thought it was much more efficient than the auto industry.

Taiichi Ohno built on Ford's idea of keeping only the inventory necessary for production and developed a comprehensive strategy for reducing waste, adding value, and bolstering profit.

Upon returning to Japan, Ohno identified the categories of wasteful manufacturing practices which became to be known as the **seven wastes**:

1. Overproduction
2. Waiting
3. Transportation
4. Inappropriate Processing
5. Excessive Inventory
6. Unnecessary Motion
7. Defects

Just In Time production and the identification of the seven wastes, along with other tools and techniques, became collectively known as the Toyota Production System. The Toyota Production System was successful and the term "**lean production**" was later coined by an MIT research team to describe the "revolutionary production and management system" they identified at Toyota. Thanks to two automobile icons and their implementation of JIT and Lean, organizations have two tools to create more efficient and productive processes.

In inventory management, the Just-In-Time or JIT system reduces wastage, improves efficiency and productivity, and contributes to smoother production flows. A shorter production cycle can decrease financial costs, inventory costs and labour costs. Below, we summarise the key features of the JIT approach.



1. Smooth production flow

One of the key features of the JIT system is a uniform production process. From the arrival of materials from suppliers to the delivery of goods to customers, the JIT system aims to prevent fluctuating production rates, which can result in delays and excess work-in-process inventories.

2. Pull-method

The pull-method contributes to this smooth production process, and it is a key feature of the JIT system. Under the pull-method, goods are produced in each stage only as they are needed at the next stage. This system eliminates work-in-process inventory between production steps, thereby reducing waiting times and associated non-value-added costs.

The pull-method also prevents **wastage** due to the production of defective products, since the output at every stage of production is inspected before passing on to the next stage.

3. Reduction in storage and waiting time

Under the JIT system, materials are purchased and goods produced only as required, rather than to build up stocks for future use. This alleviates the need to make space for holding products and materials, and results in less time wasted waiting for large amounts of materials and products.

Relatedly, the JIT system encourages faster setups of production machinery. Producing small lots of product only as required demands a faster set up of machinery, resulting in more efficiency and reduced costs. The result is higher quality raw materials and finished products.

4. Maintenance of equipment

The JIT system requires strict adherence to routine maintenance schedules. Effective, preventive maintenance of equipment will allow the company to avoid costly down time from machine breakdowns.



5. Employee satisfaction and stronger relationships

The JIT system also encourages multi-skilled workers, flexible facilities and an atmosphere of teamwork. These things improve the production system to help the company maintain a competitive edge by seeking ways to improve its products, achieve more efficient operations, and eliminate non-value-added costs.

The JIT system also encourages stronger relationships between suppliers and producers. Under the JIT system, communication and information flow between the supplier and producer are open, supporting strong supply coordination. These relationships are enhanced by long-term contracts.

6. Automated purchasing

Under the JIT system, if materials are required, the supplier will receive an electronic message to deliver them. This improves efficiency and reduces time wastage. Automated purchasing also means that existing inventory levels and production levels are calculated automatically, making things easier and more efficient.

7. Reliable vendors

Under the JIT approach, suppliers are limited. This reduces the amount of time spent on vendor relations, and ensures that the firm is working with only reliable suppliers who can deliver high quality goods on time.

8. Long-term benefits of a JIT system

A long-term concentration on production growth and supply requirements, and synchronizing changes in raw materials specifications with suppliers, provide many long-term benefits to the business. The JIT system can produce long-term benefits like cost savings, **lower production costs** and better customer satisfaction.



The differences with Lean Manufacturing

Lean manufacturing is a methodology that focuses on minimizing waste within **manufacturing** systems while simultaneously maximizing productivity.

Lean manufacturing reexamined the concept of JIT thinking in how it could add value to the product keeping in mind the customers perspective. For this reason, Lean Manufacturing embraces JIT evaluating every step of the production process in order to add value through each one of them.

Another important aspect of Lean Manufacturing is that its main goal is to reduce waste along the production process, it is not only about keeping a small inventory, and it aims to enhance cost efficiency while securing a competitive advantage over other manufacturers. Reducing waste means the minimization of unnecessary processes such as extra transportations, wrapping material, extra-large location or expensive labour.

Lean manufacturing is in a larger sense an American version of Japanese JIT and Kaizen, embracing continuous improvement while measuring results, reducing inventory and streamlining a production system that adds value to products on each manufacturing step. Lean manufacturing tries to use not only a small inventory but a set of efficient workers in an efficient space, no matter if it is dedicated to a mass or a small production.

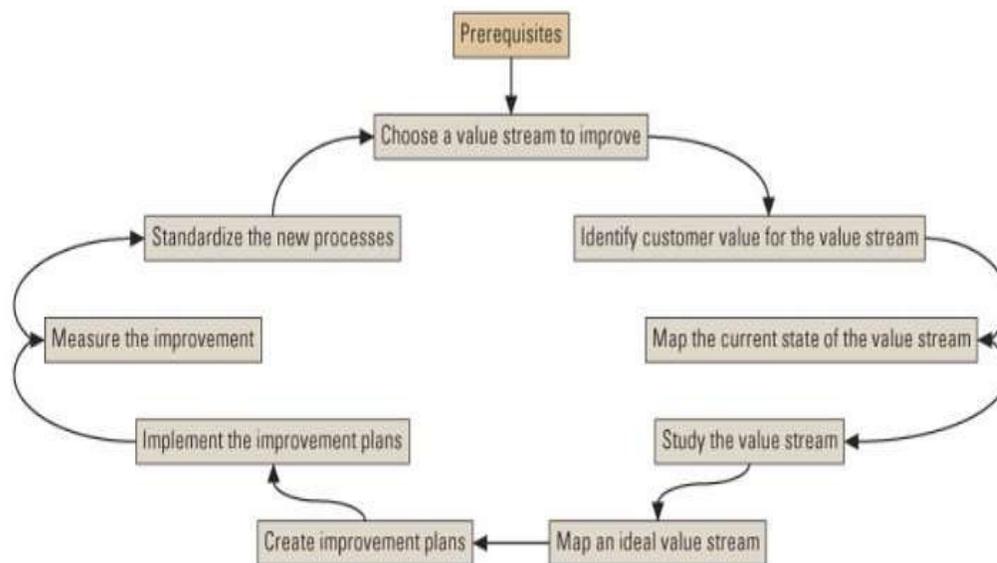
Another thing that makes Lean Manufacturing different is that it uses multi-skilled workers that can operate at different functions and levels at the organization. This also applies to machines that are designed in a way they can produce a wide variety of products in smaller or bigger amounts depending on the market needs, allowing companies to have mass and craft productions at a low cost, without having to invest in specialized equipment every time they want to launch a new product to the market.



LEAN MANUFACTURING (PRODUCTION) VS. LEAN ENTERPRISE

Lean manufacturing, or lean production, is a system of techniques and activities for running a manufacturing or service operation. The techniques and activities differ according to the application at hand but they have the same underlying principle: the elimination of all non-value-adding activities and waste from the business.

Lean enterprise extends this concept through the entire value stream or supply chain: The leanest factory cannot achieve its full potential if it has to work with non-lean suppliers and subcontractors.



THE SEVEN TYPES OF WASTE (MUDA) IN LEAN MANUFACTURING

Waste, or *muda* in Japanese, is defined as the performance of unnecessary work as a result of errors, poor organization, or communication.

Quality professionals often debate whether or not there are seven or eight wastes of lean. The eighth waste of lean is unique from the original seven because its elimination can directly benefit the employees, as well as the employer.



The eight lean manufacturing mudas can be remembered using the acronym **DOWNTIME**.

1. **D**efects
2. **O**verproduction
3. **W**aiting
4. **N**on-utilized talent
5. **T**ransportation
6. **I**nventory
7. **M**otion
8. **E**xtra-processing

Conclusion

In practice, both JIT and lean manufacturing need to consider numerous conditions in order to be successfully implemented. These includes keeping small lots of finished products, agile setups and changeover times, controlling product quality efficiently and effectively and developing a production process that aims to minimize waste and maximize the efficiency of any type of labor.

David Kiger knows that in the end, both methods are pretty similar since they aim to be better and more efficient manufacturing processes, however, JIT mainly focuses on production related concepts while lean manufacturing deeply cares about what customers really want and studies different ways to create production processes that allow to developing perfect products at the perfect price.

Reference

1. <https://asq.org/quality-resources/lean>
2. Caulkin, Simon. 1990. Britain's best factories. *Management Today*. November 60–89.
3. Grahovec, D. and Bernie Ducan, Jerry Stevenson, Colin Noone. 1999. How lean focused factories enabled Daman to regain responsiveness and become more agile. *Target*. 4th quarter, pp 47–51.



4. L., Kalleberg, A. (2004). "Precarious Work, Insecure Workers: Employment Relations in Transition". *American Sociological Review*. 74 (1): 1–22. CiteSeerX 10.1.1.1030.231. doi:10.1177/000312240907400101. ISSN 0003-1224
5. Simpson, Alex. Effective just-in-time manufacture at Hewlett-Packard. In Mortimer (1986), pp. 123–128.