

# **Implementing of Lean Manufacturing Tool In Dairy Industry: A Review**

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**ABSTRACT:** Lean manufacturing is a production strategy for organizational effectiveness focusing on waste reduction and improving productivity through application of various tools. This paper attempt to find out the reasons for sparse adoption of the concept in Indian food processing industries through a cross sectional case study. The study highlighted knowledge and understanding levels of Indian industries about the concept of lean manufacturing, its adaptability, the driving factor that lead to its adoption, benefits derived and application of lean tools looking into operating environments. A lot of journal related to the lean manufacturing are also discussed. In future, we planned to analysis problem and implement correct lean tool to rectify the problem in dairy industry.

**KEYWORDS:** lean manufacturing, dairy industries, value stream mapping, wasteidentification, waste reduction, etc.

## **I. INTRODUCTION**

Lean production is a Japanese approach to management that focuses on cutting out waste, whilst ensuring quality. This approach can be applied to all aspects of a business from design, through production to distribution. Lean production aims to cut costs by making the business more efficient and responsive to market needs. This approach sets out to cut out all activities that do not add value to the production process, such as holding of stock repairing faulty product and unnecessary movement of people and product around the plant. The original lean concept of flow date dates back to around 1910 and is attributed primarily to henry Ford. In 1900JamesWomack and Daniel Jones documented the success of the Toyota Production System in the Machine that changed the world. Womack and Jones went on to demonstrate that in represent a fundamentally different way of thinking about process, system, and organization as whole when they published lean thinking in 1996.In lean manufacturing system the use of tools is 5 S's, Kanban, Visual control, Poke yoke, SMED (single minute exchange dies), Value stream mapping,Quality tool, TPM, Cell, Piece flow, Seven wastes, etc.

Lean aims to make the work simple enough to understand, do and manage. To achieve these three goals at once there is a belief held by some that Toyota's mentoring process,(loosely called Senpai and Kohai, which is Japanese for senior and junior), is one of the best ways to foster lean thinking up and down the organizational structure. This is the process undertaken by Toyota as it helps its suppliers improve their own production. The closest equivalent to Toyota's mentoring process is the concept of "Lean Sensei," which encourages companies, organizations, and teams to seek outside, third-party experts, who can provide unbiased advice and coaching, (see Womack et al., Lean Thinking, 1998).

In 1999, Spear and Bowenidentified four rules which characterize the "Toyota DNA":

Rule 1: All work shall be highly specified as to content, sequence, timing, and outcome.

Rule 2: Every customer-supplier connection must be direct, and there must be an unambiguous yes or no way to send requests and receive responses.

Rule 3: The pathway for every product and service must be simple and direct.

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Rule 4: Any improvement must be made in accordance with the scientific method, under the guidance of a teacher, at the lowest possible level in the organization.

### II. TYPES OF WASTES

#### A. Transport

Moving products that are not actually required to perform the processing.

#### B. Inventory

All components, work in process, and finished product not being processed.

#### C. Motion

People or equipment moving or walking more than is required to perform the processing.

#### D. Waiting

Waiting for the next production step, interruptions of production during shift change.

#### E. Overproduction

Producing items more than required at given point of time.

#### F. Over Processing

Working on a product more than the actual requirement time is termed as over processing.

#### G. Defects

Defects in the processed parts are termed as waste. Repairing the defective parts or replacing the parts due to poor quality.

### III. STEPS TO ACHIEVE LEAN SYSTEMS

The following steps should be implemented to create the ideal lean manufacturing system:

1. Design a simple manufacturing system.
2. Recognize that there is always room for improvement.
3. Continuously improve the lean manufacturing system design.

#### *Design a simple manufacturing system*

A fundamental principle of lean manufacturing is demand-based flow manufacturing. In this type of production setting, inventory is only pulled through each production center when it is needed to meet a customer's order.

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The benefits of this goal include:

- Decreased cycle time.
- Fewer inventories.
- Increased productivity.
- Increased capital equipment utilization.

*There is always room for improvement*

The core of lean is founded on the concept of continuous product and process improvement and the elimination of non-value added activities. "The Value adding activities are simply only those things the customer is willing to pay for, everything else is waste, and should be eliminated, simplified, reduced, or integrated" (Rizzardo, 2003). Improving the flow of material through new ideal system layouts at the customer's required rate would reduce waste in material movement and inventory.

*Continuously improve*

A continuous improvement mindset is essential to reach the company's goals. The term "continuous improvement" means incremental improvement of products, processes, or services over time, with the goal of reducing waste to improve workplace functionality, customer service, or product performance.

### IV. LEAN MANUFACTURING TOOLS

#### A.5s

5S is the name of a workplace organization method that uses a list of five Japanese words: seiri, seiton, seiso, seiketsu, and shitsuke. Transliterated or translated into English, they all start with the letter "S". The list describes how to organize a work space for efficiency and effectiveness by identifying and storing the items used, maintaining the area and items, and sustaining the new order. The decision-making process usually comes from a dialogue about standardization, which builds understanding among employees of how they should do the work.



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### B. JIDOKA (AUTONOMATION)

Autonomation describes a feature of machine design to affect the principle of jidoka used in the Toyota Production System (TPS) and Lean manufacturing. It may be described as "intelligent automation" or "automation with a human touch." This type of automation implements some supervisory functions rather than production functions. At Toyota this usually means that if an abnormal situation arises the machine stops and the worker will stop the production line. It is a quality control process that applies the following four principles:

1. Detect the abnormality.
2. Stop.
3. Fix or correct the immediate condition.
4. Investigate the root cause and install a countermeasure.

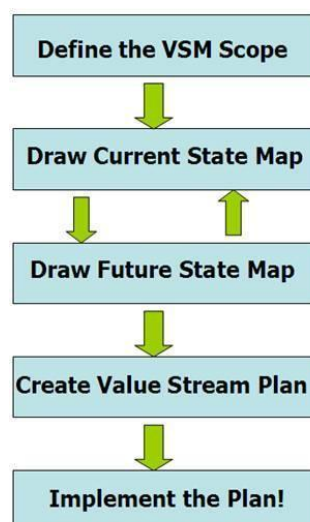
Autonomation aims to prevent the production of defective products, eliminate overproduction and focus attention on understanding the problems and ensuring that they do not reoccur.

### C. VALUE STREAM MAPPING

Value stream mapping is a lean-management method for analyzing the current state and designing a future state for the series of events that take a product or service from its beginning through to the customer. At Toyota, it is known as "material and information flow mapping". It can be applied to nearly any value chain.

Using The Method

1. Planning and preparation. Identify the target product family or service. Create a charter, define the problem, set the goals and objectives, and select the mapping team. Socialize the charter with the leadership team.
2. Draw while on the shop floor a current state value stream map, which shows the current steps, delays, and information flows required to deliver the target product or service. This may be a production flow (raw materials to consumer) or a design flow (concept to launch). There are 'standard'symbols for representing supply chain entities.
3. Assess the current state value stream map in terms of creating flow by eliminating waste.
4. Draw a future state value stream map.
5. Work toward the future state condition.



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### V. LITERATURE SURVEY

SOPs are often the only documented record of how work is done. They can protect companies from losing valuable corporate knowledge when an employee departs. This also keeps the remaining employees from struggling to relearn the task. This will lead in reduction in the time, effort, and money of the dairy companies that can use these SOP in order to improve their work and manage it in a more efficient way [1]. The company's current state will be analyzed so to detect any non-value adding processes termed as waste. In value stream mapping Future state map is developed by eliminating all the non-value added process from entire production line [2]. Poka yoke is an error proofing lean tool used to avoid error before it occurs [3]. Continuous improvement are often leads to improve the product at production time. It leads to reduce over processing [4]. Preventive Maintenance in this Maintenance systems affect on directly budget and the profitability of the organization; hence, lack of proper maintenance planning in the organization might lead to reduction of equipment useful life [5]. Just-In-Time is used in industry to pull parts through production based on customer demand instead of pushing parts through production based on projected demand. Just-in-Time system (also lean production system) implemented by many other auto manufacturers with different degrees of success as a means to reduce production costs [6].

### VI. CONCLUSION

This paper presents the review of lean thinking and its concept through definitions from literature. The main focus of lean manufacturing is to eliminate waste, doing things better in half of the resources as mass production requires, providing higher quality with lesser cost. The good understanding of lean principles and practices is required for successful implementation of lean as lean practices without knowing lean principles can give short term success but may fail as long term strategy it presents the review of barriers of lean implementation from literature review. Understanding the barriers is important for managers to avoid failures and to sustain lean leap. The paper contributes by identifying enablers and barriers in implementing the lean principles and practices, methodologies used in lean measurement of an organization in the Indian dairy manufacturing industry.

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