

Lean management, lean principles, lean manufacturing

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Abstract: My article is focused on one main topic, the topic of lean management. I describe lean management in the article, in basic definitions, principles, and contexts. I do not deal in detail with individual elements and aspects of lean management in the article, because that was not the goal of the article. I define lean management, and its meaning in business practice, further I describe the principles of lean management and lean production.

Keywords: lean management, lean concept, lean principles, lean manufacturing, waste.

INTRODUCTION

One of the most effective and proven approaches and ways to reduce overall costs in the company is reducing waste, reducing waste generation, eliminating waste, and eliminating all types of waste in the company. The goal of lean management, which I focus on in the article, and the goal of lean production is to identify, locate, analyse, and eliminate waste in the company, to eliminate waste in all business processes. To eliminate waste, we use a process we call value stream mapping. Thus, one of the main goals of lean production is the identification, analysis, and elimination of "seven types of waste in production and the enterprise as a whole." Seven types of waste: storage, waiting, defects, overproduction, movement, transportation, and reprocessing. These seven types of waste occur in most processes, in most production operations, and in most production enterprises, they exist where production takes place. To identify, analyse and eliminate waste, it is important to understand what is waste, what is waste, and where it occurs. I think that the correct and functioning implementation of lean management and lean manufacturing will positively affect the corporate culture and, naturally, the overall results of the company. However, lean management is primarily about increasing added value, it is aimed at eliminating all activities that do not have added value for the customer.

The lean manufacturing tools are not limited to industry only but are being used in many areas as shown in Fig. 1. However, the scope is not limited these sectors only, it can be applied from a family to space company [1].

Lean thinking is being used to decrease setup

times, group sizes, and inventories. Lean is all about removing misuse in the project. This comprises waste in time as well as cost. As project have reduced costs and improved class, the primary competitive gauge is the capability to react to the customer [2].



Fig. 1. The main areas to implement *Lean manufacturing* [1]

1 LEAN MANUFACTURING

It is a standardized approach for the identification and elimination of waste (non-value-added process/activities) for achieving perfection.

A systematic approach for maximization of value and elimination of waste. A systematic/standardized approach that reduces the time frame between the customer's order and delivery of product through waste elimination [3].



Fig. 2. Lean Manufacturing [3]

2 LEAN MEANING

Lean means elimination or minimizing of any kind of waste/non-value-added activity within the manufacturing process. (e.g., 3M waste – *Muda*, *Mura*, and *Muri*, etc.)



Fig. 3. Normally 95 % of Total Lead Time is Non-Value Added [3]

Removal of unwanted activity/process that has no value from the customer's perspective. Lean is a value-added process for which customer is willing to pay. There are various *Lean Manufacturing Tools* or ways to be Lean:

- *Lean 5S.*
- *7 waste of Lean Manufacturing.*
- *Value Stream Mapping-VSM.*
- *KAIZEN.*
- *POKA-YOKE.*
- *Total Quality Management-TQM.*
- *Total Preventive Maintenance-TPM.*
- *Six Sigma-DMAIC.*
- *Single Minute Exchange of Die-SMED.*

- *Just In Time-JIT.*
- *Continuous Improvement/PDCA.*
- *Cellular Manufacturing.*
- and many more *Lean Manufacturing Tools...*

3 LEAN PRINCIPLES

5 Lean Principles defined by James Womack & Daniel Jones are:

1. *Value* – value must be specified for the product from the customer's point of view.
2. *Value Stream* – identify the *value stream* for each product from the supplier to the end customer.
3. *Flow* – make value *Flow* without interruption along the value stream.
4. *Pull* – an organization must establish a *Pull* and let the customer *Pull* value from the supplier/producer.
5. *Perfection* – an organization must strive for *Perfection*.

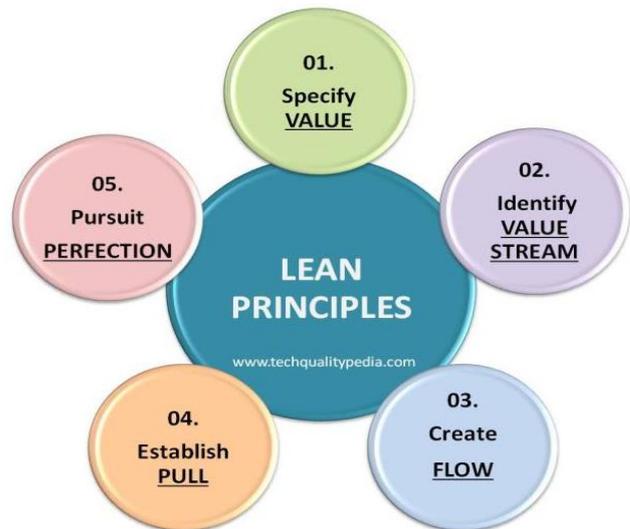


Fig. 4. Lean Principles [3]

Lean principles are comprehensively explained by *James Womack & Daniel Jones* in his book - "*Lean Thinking: Banish Waste and Create Wealth*".

Lean Concept | Benefits

- *Waste Elimination,*
- *Maximize Value,*
- *Reduction of Lead Time,*
- *Reduction of Variations,*
- *Product Flow without interruption,*
- *Pull of the Customer,*
- *Continuous Improvement [3].*

CONCLUSION

My article is focused on the topic of lean management, it is the main topic of the post. I describe lean management in the post in basic definitions,

principles, and contexts. I focused on this main goal, i.e., in a limited space to acquaint the reader with the basics of lean management, the basics of lean production, the basic principles of lean management, its meaning, and its goals, and the justification of lean management in industrial practice.

REFERENCES

[1] VIKAS, G. - PANNIWALA, M. (2015): *Lean manufacturing: a review*. International Journal of Science Technology & Management. Volume 3, Issue

2, July, 2015. Available from: <https://www.avjournals.com>. ISSN: 2321-774X.

[2] ROSE, A.M.N. – DEROS, B.M.D. - RAHMAN, M.N.A.B. (2010): *Development of framework for lean manufacturing implementation in SMEs Asia pacific*. Industrial Engineering and Management Systems Conference, Melaka, Dec. 7-10, 2010.

[3] *LEAN MANUFACTURING. LEAN PRINCIPLES. LEAN 5S*. January 25, 2021. Available from: [https://Lean Manufacturing | Lean Principles | Lean 5S \(techqualitypedia.com\)](https://Lean Manufacturing | Lean Principles | Lean 5S (techqualitypedia.com))