

Survey on Lean Manufacturing and its strategies

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Submitted: 15-01-2021

Revised: 27-01-2021

Accepted: 31-01-2021

ABSTRACT: Lean manufacturing is a group of tools and technologies that aims for the continuous elimination of all waste in the production process. The theory of lean manufacturing provides the quality of products in low production cost and provides customer fulfilment. The main aim of this paper is to study different lean manufacturing concepts under various lean strategies. This literature review will be useful to find out the status of lean manufacturing in industries and its ways of implementation. This paper presents a literature survey to give clear idea about the status of lean manufacturing and its strategies with help of collection of various related papers.

I. INTRODUCTION

Lean Manufacturing and its implementation in industries are considered to be a waste reduction method as suggested by many authors, but in practice lean manufacturing maximize the value of the product through minimization of waste (1). Lean manufacturing is used as a common tool to concentrate resources and energies on producing the value added features while identifying and eliminating non value added activities. Value of the item is defined as an item or feature for which a customer is willing to buy and pay. All other aspects of the manufacturing process are deemed to be waste (2,3).

Many industrial organizations, specifically automotive organizations, struggled in globally competitive markets and the new customer driven. These parameters give a big challenge to organizations to look for new techniques and methodologies to continue moving up the ladder in the present changed market scenario. While some organizations continued to grow on the basis of need of economic constancy, many of the other organisations struggled because of their lack of understanding of the changed cost practices and customer mind-sets. To overcome this scenario and to become more profitable, many manufacturers turned to the term called Lean Manufacturing (LM). The main objective of Lean Manufacturing (LM) is to be highly responsive to customer

demand by reducing waste. Objective of Lean Manufacturing is at fast production of products and services at the lowest cost as required by the customer satisfaction. The lean concept originated in Japan using the methodology called Toyota Production System. Using this method Toyota produced automobiles with less investment and variety of products. Lean manufacturing gives improved productivity and quality (4).

II. LITERATURE REVIEW

Vinicius Mitsuo Kojima Campos et al., (5) (2016) explained about the concept of the application of Kaizen event seeks to measure the benefits generated by the implementation of the philosophy of lean manufacturing, machine working setup aspects, manufacturing process flow, reduced delivery lead-time and inventory process.

The author Ashmore discussed about the meaning of Kaizen. (2001) Kaizen originated in Japan in 1950 when the management of industries and government recognized that there was a problem in the current system of management creating a labour shortage. Kaizen is a philosophy to be used not only in management but also in everyday life. It is a kind of thinking and management (6).

A. P. Chaple et.al., presented the review concept on lean principles and practices followed by the Indian industries, identifying enablers and barriers in implementing lean principles and practices and diffusion of lean manufacturing & level of diffusion in Indian industry sectors (7).

Antony Pearce and Dirk Pons interested in explaining the issues like identifying best lean tool to implement in specific situation and how to make balanced evaluation of opportunities and threats for each tool etc., in situational application of lean tools (8).

Norani Nordin et.al., discussed about drivers and barriers influencing the implementation of lean manufacturing in Malaysian automotive component manufacturing industries. They revealed the

reasons for main barriers those prevent the lean implementation (9).

Seyed Mojib Zahraee discussed about the investigation carried out in Iran manufacturing industries to identify the efficient practices and techniques used for lean manufacturing implementation in Iran industries. Also the author presented a detail case study on quantitative approach used, Research implications, practical implications and originality about the testing and evaluation of efficient practices and techniques used for lean manufacturing implementation. Author discussed about various available lean practices and various manufacturing industries. Few available lean methods and techniques are cellular manufacturing, Just in time, Kanban, total preventive maintenance, poke yoke, visual control, single minute exchange of dies, total quality management (10).

The author Holweg explained that, If lean manufacturing is holistically implemented in manufacturing industries, then the performance of lean manufacturing can be widely realised, adopted and accepted as best suitable practice in and across the countries. Author also discussed about the methods to be adopted to deliver good quality and low cost products fast (11).

Wangwe et al., mentioned about various challenges in implementing lean manufacturing in Iran industries. The numerous challenges like old, obsolete and outdated manufacturing systems, lacuna in capital assessment, shortage in manpower and skilled labour, economic fluctuations, resources shortage like water and electricity, raw material expense, shortage in managerial skills, shortage in research and development, feedback regarding locally produced items etc., are the confronting challenges in Iran industries. Therefore there is a need of transforming business methods, strategies and structures. So the management should come forward to change the mission to reach the vision to look into these broader development perspectives by changing their traditional operations (12).

Golroudbary and Zahraee also discussed about the problems and challenges faced by the manufacturing industries like resource shortage, resource wastage and pollution which in turn affects the production cost of the industry (13).

The main aim of lean manufacturing is cost reduction and is achieved by decreasing the non value activities. Based on Toyota production system various lean manufacturing techniques have been applied in automotive and electronic manufacturing systems (14).

Puvanasvaran et al. proposed that the important role of how communication process supports in lean practice in manufacturing industries especially industries which are in the starting stage of lean concept implementation (15).

Piotr Jedynak concerned about the lean implementation in lean manufacturing industries. Also he identified few determinant factors for lean implementation like management support, management risk, communication and supplier details. The author explained various lean management methods adopted in lean manufacturing industries. Few of them are: the essence and sources of the concept, structural approach to the concept, Determinant factors for implementation of lean management, selected experience in processes of lean management implementation (16).

Author Rymaszewska has found these Parameters are typical for small and medium industries which are not neutral to lean implementation by either fostering or inhibiting it (17).

The authors Marodin and Aurin specified different types of risk factors like lack of technical knowledge by lean, difficulties in financial aspects, lack of human resources, lack of support on the industry area, lack of communication, operators insecurity in handling new attributes and lack of technical knowledge of managers in handling project are involved in lean implementation (18).

Authors Sundareshan S D et al., presented the literature review on lean implementations and its summary. The main objectives of this literature review is Identifying the level of Lean implementation in different sectors in industries, the tools used in lean implementation, and to evaluate the advantages & disadvantages of Lean implementation in manufacturing industries. From the survey authors identified that continuous flow and Toyota Production System(TPS) are the commonly used lean tools in industries (19).

Kashif Mahmood and Shevtshenko discussed and provided the understanding of lean approach to reduce cost, to enhance productivity, minimising waste and improve customer value. They also provided the successful lean efforts and the factors which makes lean more effective. (20).

Vikas Gupta et al., in Lean manufacturing: A Review, focussed on the concept of lean manufacturing in improving productivity by reducing the waste and cost. Also they discussed about the types of waste and tools which are used to reduce the waste to improve the productivity (21).

III. CONCLUSION:

This survey summarises the set of tools and methodologies used in Lean manufacturing that aims for the continuous elimination of all waste in the production process. This paper also provides the review of about 20 papers and studied different lean manufacturing concepts under various lean strategies. This study helped to find out the status of lean manufacturing and its ways of implementation in manufacturing industries. This paper presented a literature survey to give clear idea about the status of lean manufacturing and its strategies with help of collection of various related papers.

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**International Journal of Advances in
Engineering and Management**
ISSN: 2395-5252



IJAEM

Volume: 03

Issue: 01

DOI: 10.35629/5252

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