



Eliminating Seven Wastes By Using Lean Manufacturing Tools In Automobile Industry: A REVIEW

Mayank Singh¹, Raj Kumar^{2*}

¹Research Scholar,^{2*}Assistant Professor, ME Department, UIET, MDU, Rohtak,
Ermayank31110@gmail.com

Abstract – Lean tools require a prospective way to figure out and optimize the waste found in manufacturing units. In industry Seven type of waste are found, which are categorized by Japanese companies. Toyota is implementing these concepts in manufacturing plants with a focus on increasing productivity by simplifying and optimizing operations by reducing waste from the running system. It has to identify or optimize all waste which directly or non-directly reduces the system efficiency or increases defect rate and inventory stock. Lean tools provide a smooth system with continuous improvement and increasing productivity by using tools such as, Indian SMEs, Kaizen, Total Preventive Maintenance, Overall Equipment Effectiveness, and 5's etc.

Key words: Lean tools, Indian SMEs, Kaizen, Total Preventive Maintenance, Overall Equipment Effectiveness, Increasing Productivity.

1. INTRODUCTION

Lean manufacturing concept was first launched and implemented by Toyota Japan, which is an automobile company certified by IATF. It reduces cost, makes high-quality goods, increases flexibility, and develops fast response systems. These tools are working in daily manufacturing practice for achieving goal to optimize wastes towards moving of customer demand. It totally depends on customer demand and its working procedures. The main purpose of lean manufacturing is to minimize the system waste and improve productivity and working culture. There are some steps to implementing lean tools.[1]

1.1 There are some step to implement lean tool in manufacturing industry:

1. First step to found the waste: Organization need to identified non payable operations or hidden activities wastes in the system.

2. Categories the waste form which present in the systems:- Organization essential to rectified type the wastes. find the root course by using lean manufacturing technique like why-why analysis. There are many tools and technique that are help in optimizing and eliminating wastages.

3. Find root cause of the identified wastes:- Organization must identify the type of waste and find the root cause by using lean manufacturing technique like why-why analysis.

4. The last step complete after finding the solution of wastes and test them and success to implement by using lean manufacturing tools:- If identified waste solution are founded and tested then they should be implemented horizontal and also provide training time on every schedule in organization which was increase productivity.

1.2 Kinds of Waste

It Classified into 7 types of wastes:-

(1) Overproduction:- Wrong planning produces more product than the demands of customer, or produces too early for the dispatch date. This increases the risk of manufacturing the wrong item or goods[2].

(2) Defects:- High defect rates directly affect the cost of final selling product; this also include mistakes in paper work, late delivery, producing products with wrong planning or wrong operation execution, etc. If defects are produced by any reason then have to go through different procedures under quality control, like rework material segregated in different stages such as reject material given a red label and rework material given a yellow label. This rework reduces the productivity or quality of the product and increases unnecessary scrap.[7]

(3) Inventory:- It means organizations procure and make an unnecessarily large amount of material in different segments, like raw materials, processed materials, and finished goods. Large inventory require high financing cost and also required high storage cost. Due to that it make high possibility to produces defect in raw material. It may increase lead times. So, it is necessary to procure and make material to meet customer demand.[1]

(4) Transportation:-In any organization material movement is large from one working station to other working station or to the dispatch yard, Due to this excess movement down the production rate and customer have not given any charges.[14]These excessive movement between working stages results increase the cycle times or occupies large space. Due to double material handling and large movement gives damage and increase rejection rate.

(5) Waiting:- it is delay period between one working stage to next working stage it has many cause behind low efficient output like as low capacity machine worked, working environment not well and some other reason to reduce the productivity of the station. This type of delay also known as Bottle neck operation. Which is very important to rectified and resolving for high productivity.[13]

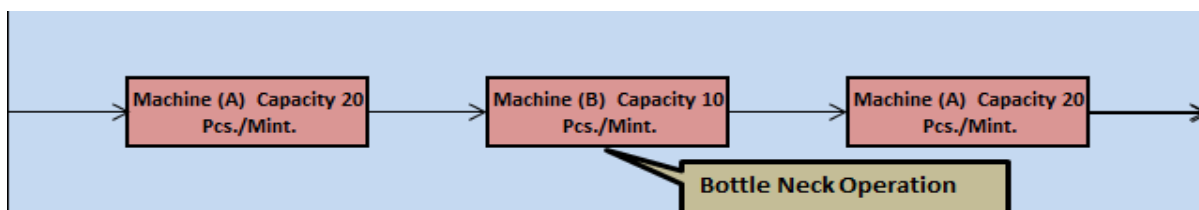


Fig.2 Bottle neck Operation.

(6) Motion:- it is unnecessary movement of worker which is add in cost of final product and also it reduces efficiency of worker also reduce the system capacity.[12]

(7) Over processing:- There are some causes to increase the over processing in manufacturing industry like as ,customer requirement not defined clearly, communication gap between manufacturing operation as per customer need, wrong procedure done against less time and less cost taken operation.(Some of the causes of increased overprocessing in the manufacturing industry include unclear customer requirements, a communication gap between manufacturing operations and customer needs, incorrect procedures performed in order to save time and money.[1]

2. Objectives of the Paper

To study present working system of the Automobile industry and find the causes behind for lean wastes.

- It eliminates waste and increases productivity.
- To increase the moral value of employees in the working plant.
- Lean manufacturing tools reduce costs not only in production but in administration and office as well.
- Continuous improvement.

3. LEAN-MANUFACTURING TOOLS & TECHNIQUES

Numerous Kinds of lean manufacturing tools are present and utilization of these tools to optimize system operation by reduces or eliminating wastes. These techniques like as TPM, Kanban, 5'S, SMED, Just -In -Time (JIT), OLE etc.

3.1 Just in time (JIT): "Just in time" is an advanced method in lean strategy and supply chain management. Its primary goal is to provide the exact component at the right time at the right place. It helps to produce goods with minimum scrap, including time, material, and process defects. Just in time reduces physical inventory. It is well known as JIT-Production, JIT-sequence, or (TPS).[5]

3.2 Kanban: Kanban is a lean method to reduce waste in manufacturing systems. Its aim is to improve or make smooth production and manage work by matching demand with production capacity.[8] Toyota has six rules to effectively implement Kanban in production:

- 1) Never pass a defective part to the next station.
- 2) Take only what is needed in production.
- 3) Produce fixed quantity product.
- 4) level the production.
- 5) Smooth Production.
- 6) Standardizing all processes.

3.3 KPI (Key Performance Indicator): It is a measurement method that support or facilitates for achieving complex goal and new milestone targets of the organization. Generally, there are two perspectives:

- 1) Perspective for achieving the organization's goal.
- 2) Perspective for lean manufacturing by reducing wastes.

3.4 OEE (Overall Equipment Effectiveness): Overall equipment effectiveness is a term to identify or measure how efficiently production has utilized machines for manufacturing 100% of goods without downtime.[3] OEE calculation is based on three factor like as: Availability (e.g breakdown), Performance (e.g. small stop or slow cycle rate) and defect (rejection rate).[6]

4.Literature Review

Because of the explosion in increasing demand and quality concerns, companies have to accept new technology and change their working techniques and culture. Improve productivity by implementing lean tools such as TPM, Six sigma, Key performance Indicator, Key, Overall Equipment Effectiveness, and ISO and IATF norms. These tools help to identify or eliminate waste from the system. which is present in the manufacturing plant. For those reasons, the organization has initiate to make a good environment for reducing cost and lead time.

By using lean manufacturing tools.it has to reduces cycle time and measure the line balance time efficiency in truck body assembly line system and improve the production capacity at same running line.[11]

Lean manufacturing tools help to eliminating seven wastes which is found in organization and also reduces cost of the final products by increasing productivity. Lean tools change and increase moral value not only in working area, office area and administrator area.

Last some decade gap between international companies and the small Indian companies are ls so, high. Due to lack of a competitive working environment and the latest technology-based machines, in the current scenario, Indian companies adopt new technology machines, adopt automation, new strategic tools, and also provide a competitive working environment. These changes have improved product quality and increased the performance of the overall manufacturing plant to meet the quality of the product through the practices of lean tools.[10]

BY using lean tools to optimize the cycle time or time management strategies of working stations and during producing multi products with mass productivity at same line.[4]

Toyota Production System has generate the lean principal for eliminating wastes for heavy flow.[9]

Lean tools increase productivity and quality by reducing or eliminating extra time-consuming activities in an organization. Its aim is to reduce cost and rejection percentages.[16].

The authors diagnose the major reason for the high cost of the final product by the implementation of lean tools and techniques not in manufacturing, which includes offices and administrators, and human resources in an organization.[15]

5.Scope of Work

Lean manufacturing tools helps to improve the working efficiency of both machine and manpower and also increase the manufacturing plant efficiency with 25% to 30%. It helps to reduces system wastes, rejection rate and reduce cost of the product.

6. CONCLUSION

In Automobile industry lean manufacturing tools are used in every working station for increasing productivity and making smooth running all operation by reducing all wastes which are reduces capacity of running plant. In this case study has optimize operation and increases productivity 10% to 20% on shop floor.

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