To Make the Production Faster & Easier through Lean Manufacturing Process & Minimize the Waste

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Abstract

This research aims at implementing lean manufacturing processes to reduce wasteful expenditure, and in the era of intense competition, industries are adopting lean manufacturing for successful survival, as this kind of spending can happen in countless ways. To reach that reduction in spending, manufacturing should set one or more of the following goals: Improve Quality, Eliminate Waste, Reduce Lead Time, and Reduce Total Cost. Waste is anything that provides no value to the customer, contributes nothing to your bottom line, but absolutely has a cost. It exists at every level of your company, in every department, and within virtually every activity that takes place. The ultimate lean manufacturing target is the total elimination of waste, and improve factory automation. And while that is virtually impossible to achieve, it should still be the ultimate goal. Here are the most common areas of waste in business, like Inventory, Overproduction Over-processing Transportation, and Downtime etc.

Keywords: Lean Manufacturing

I. INTRODUCTION

The primary goal of lean business processes is to reduce wasteful spending. This kind of spending can happen in countless ways given how different every business can be. To reach that reduction in spending, businesses should set one or more of the following goals:

A. Improve Quality

Lean business processes allow you to focus on quality on the front end. This cuts the costs of your product in the long run and increases the lifetime value of your customers.

B. Eliminate Waste

Thus, an essential step in creating lean business processes is eliminating wasteful activities that eat up time and resources but provide no value to you or the customer.

C. Reduce Lead Time

Lead times are the gaps between steps in a process or the amount of time it takes to complete a series of tasks. For example - The lead time for turning raw materials into a finished product

D. Reduce Total Cost

Your total cost is made up of the direct and indirect costs of getting your product to customers or selling and delivering your service to customers finding ways to reduce cost through lean processes can help you retain market share and prevent your profit margin from shrinking.

II. THE FIVE PRINCIPLES OF LEAN MANUFACTURING

1) Principle 1: Accurately specify value from customer perspective for both products and services.
2) Principle 2: Identify the value stream for products and services and remove non-value- adding waste along the value stream.
3) Principle 3: Make the product and services flow without interruption across the value stream.
4) Principle 4: Authorize production of products and services based on the pull by the customer.
A. Eight Tips of Lean Manufacturing to ensure that Productivity is kept to a Maximum

1) Be Efficient
2) Delegate
3) Reduce Distractions
4) Have the Right Tools and Equipment
5) Improve workplace conditions
6) Offer Support and
7) Set Realistic Goals
8) Practice Positive Reinforcement

III. The Key Areas of Waste in Lean Manufacturing

1) The ultimate lean target is the total elimination of waste. And while that is virtually impossible to achieve, it should still be the ultimate goal. Here are the most common areas of waste in business, regardless of sector or industry.

2) Here are a few examples from various industries:
   - The creation of parts that don’t meet safety regulations
   - Incorrect data entry
   - Wrong food being delivered to your table in a restaurant
   - Transportation waste involves moving inventory, people, tools, or other items more often or over farther distances than is necessary which include-Moving hospital patients from department to department
   - Waiting involves customers, patients, or parts sitting idle. Waiting happens when the person or item is ready for the next step, but the process is not ready to accommodate them.
   - The waste of motion involves unnecessary movement of people or items within a work center. It is often the result of neglecting the 5s’. Here are some examples: Overproduction, Over processing, Inventory, Human Potential.

Effective Ways to make Manufacturing Faster and Easier is by

1) Eliminate Throughput Bottlenecks
2) Improve Employee Training
3) Minimize Physical Prototyping Where Possible
4) Reduce the Parts Rejection Rate.
5) Use Factory Automation.
6) Increase Manufacturing Safety.

B. Toyota Production System

1) Reduce cycle time
2) Increase capacity
3) Increase productivity
4) Increase employee satisfaction
5) Reduce inventory
6) Improve lead times
7) Improve quality
8) Increase customer satisfaction
9) Reduce costs
10) Increase sales
11) Increase profits
   - It aims to increase production efficiency by the elimination of waste.
   - Other Lean manufacturing process include Cellular Manufacturing, Continuous Improvement

IV. GARMENT MANUFACTURING PROCESS

- Garment manufacturing process consists of series of different steps. These steps are broadly divided into two categories pre-production and production process. The pre-production process consists of designing the garment, pattern design, sample making, production pattern making, grading and marker making. The production process consists of cutting, stitching (preparatory and assembly) and finishing all these process are described here.

A. Existing Production Layout
- Existing layout of the sewing, the individual parts are made in preparatory sections and these parts are then transported manually to the assembly section. In the assembly section, these parts are assembled to shape a final garment.
- There is quality check at the end of each section to avoid defective parts to the next step. WIP movement in preparatory section is made with the help of the long table along with machines, whereas work aids attached with each machine serves this purpose in the assembly section.

B. Style Communication
- Style communication between different staffs and operators is critical part of garment manufacturing to minimize style related confusion during production.
- In this system commercial production starts only after checking the final parameters of trial production.

C. Assembly Section
This section consists of ten operations to make one full garment. The flow chart for the assembly operation of garment manufacturing is shown in the following Figure:

![Assembly Section Production Flow Chart](image)

![Fig. 2: Assembly Section Production Flow Chart](image)

V. ADVANTAGES OF LEAN MANUFACTURING PROCESS

- Improved Customer Service, Improved Productivity, Improvements in throughput
- Improvements in Quality, Reductions in defects and rework, Innovation
- Reduced Waste; Less transport, moving, waiting, space, and physical waste.
- Improved Lead Times; Business able to respond quicker, quicker set ups, fewer delays.
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– Improved Stock Turns; Less work in progress and Inventory, so less capital tied up.

VI. LIMITATIONS OF LEAN MANUFACTURING PROCESS

– Insufficient supervisory skills to implement lean, Employee attitudes/resistance to change
– Insufficient workforce skills to implement lean, insufficient senior management skills to implement lean, insufficient management time, Cultural issues, Cost of the investment
– Insufficient understanding of the potential benefits, to convince shareholders/owners

VII. CONCLUSIONS & RECOMMENDATIONS

– Collaborate with multinational process industries like garment industry to implement lean manufacturing successfully and to minimize waste
– Attempts should be made to increase awareness, education and training about lean manufacturing in garment industry and to minimize waste
– Starting with implementation of lean tools which do not involve high expenses and major alterations in equipments such as 5S, TPM, visual control, kaizen and “work standardization” in garment industry to minimize waste
– Exploring possibilities for implementation of lean tools such as Kanban, “pull production,” “JIT production” and “production levelling” when product becomes discrete in garment industry and to reduce waste

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