

# **Implementing of Lean Tool in Garment Industry: A Review**

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**ABSTRACT:** Traditionally operated garment industries are facing problems like low productivity, longer production lead time, high rework and rejection, poor line balancing, low flexibility of style changeover etc. These problems were addressed in this study by the implementation of lean tools like cellular manufacturing, single piece flow, work standardization, just in time production etc. implementation of lean tools, results observed were highly encouraging. Some of the key benefits entail production cycle time decreased by 8%, number of operators required to produce equal amount of garment is decreased by 14%, rework level reduced by 80%, production lead time comes down to one hour from two days, work in progress inventory stays at a maximum of 100 pieces from around 500 to 1500 pieces. Apart from these tangible benefits operator multi-skilling as well as the flexibility of style changeover has been improved. 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 garment industry.

**KEYWORDS:** cellular manufacturing, single piece flow, work standard.

## **I. INTRODUCTION**

During II world war, the economic condition of Japan was heavily destroyed. Due to this there was scarcity of fund resulting in limiting access to corporate finance. In this situation, neither Toyota was able to set up a mass production system like their American counterparts, nor it was possible to layoff the employees to reduce their cost due to legislation. Anyhow Toyota had to devise a new system for reducing costs to sustain in the market. So they decided to produce a small batch of products which would reduce inventories; it means they would need less capital to produce the same product. But this is obstructed by the practical difficulty of changing tools and production lines frequently. To cope with this problem they started making multipurpose tooling systems in their machines and trained their employees in changeover time reduction methods. At the same time, Toyota realized that investing in people is more important than investing in bigger size machinery and continues employee training throughout the organization. This motivates all employees and they are more open to the improvement process and everyone started giving their input to the company. In this way, short production runs started by Toyota became a benefit rather than a burden, as it was able to respond much more rapidly to changes in demand by quickly switching production from one model to another. Toyota didn't depend on the economies of scale production like American companies. It rather developed a culture, organization and operating system that relentlessly pursued the elimination of waste, variability and inflexibility. To achieve this, it focused its operating system on responding to demand and nothing else. This in turn means it has to be flexible; when there are changes in demand, the operating system is a stable workforce that is required to be much more skilled and much more flexible than those in most mass production systems. Over time, all these elements were consolidated into a new approach to operations that formed the basis of lean or Toyota Production System.

## **II. LEAN PRINCIPLE**

Principle 1: Accurately specify value from customer perspective for both product and services.

Principle 2: Identify the value stream for products and services and remove non-value-adding waste along the value stream.

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Principle 3: Make the product and services flow without interruption across the value stream. Principle 4: Authorize production of products and services based on the pull by the customer. Principle 5: Strive for perfection by constantly removing layers of waste.

### III. KIND OF WASTE

#### A. *Overproduction*

Producing items more than required at given point of time i.e. producing items without actual orders creating the excess of inventories which needs excess staffs, storage area as well as transportation etc.

#### B. *Waiting*

Workers waiting for raw material, the machine or information etc. is known as waiting and is the waste of productive time. The waiting can occur in various ways for example; due to unmatched worker/machine performance machine breakdowns, lack of work knowledge, stock outs etc.

#### C. *Unnecessary Transport*

Carrying of work in process (WIP) a long distance, insufficient transport, moving material from one place to another place is known as the unnecessary transport.

#### D. *Over processing*

Working on a product more than the actual requirements is termed as over processing. The over processing may be due to improper tools or improper procedures etc. The over processing is the waste of time and machines which does not add any value to the final product.

#### E. *Excess Raw Material*

This includes excess raw material, WIP, unfinished goods causing longer lead times, obsolescence, damaged goods, transportation and storage costs, and delay. Also, the extra inventory hides problems such as production imbalances, late deliveries from suppliers, defects, equipment downtime, and long setup times.

#### F. *Unnecessary Movement*

Any wasted motion that the workers have to perform during their work is termed as unnecessary movement. For example movement during searching for tools, shifting WIP etc.

#### G. *Defects*

Defects in the processed parts are termed as waste. Repairing defective parts or producing defective parts or replacing the parts due to poor quality etc. is the waste of time and effort.

#### H. *Unused Employee Creativity*

Loosing of getting better ideas, improvement, skills and learning opportunities by avoiding the presence of employee is

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termed as unused employee creativity.

### IV. LEAN MANUFACTURING TOOLS

#### A. Continuous improvement

Continuous improvement (CI) can be defined as the planned, organized and systematic process of ongoing, incremental and company-wide change of existing practices aimed at improving company performance. Activities and behaviors that facilitate and enable the development of CI include problem-solving, plan-do-check-act (PDCA) and other CI tools, policy deployment, cross-functional teams, a formal CI planning and management group, and formal systems for evaluating CI activities. Successful CI implementation involves not only the training and development of employees in the use of tools and processes, but also the establishment of a learning environment conducive to future continuous learning

The short description of PDCA cycle is given below

- 1) *Plan*: Identify an opportunity and plan for change.
- 2) *Do*: Implement the change on a small scale
- 3) *Check*: Use data to analyze the results of the change and determine whether it made a difference.
- 4) *Act*: If the change was successful, implement it on a wide scale and continuously assess the results. If the Change did not work, begin the cycle again.



Thus continuous improvement is an ongoing and never ending process; it measures only the achievements gained from the application of one process over the existing. So while selecting the continuous improvement plan one should concentrate on the area which needs more attention and which adds more value to our products .

#### B. Just-In-Time

Just in time is an integrated set of activities designed to achieve high volume production using the minimal inventories of raw materials, work in process and finished goods. Just in time is also based on the logic that nothing will be

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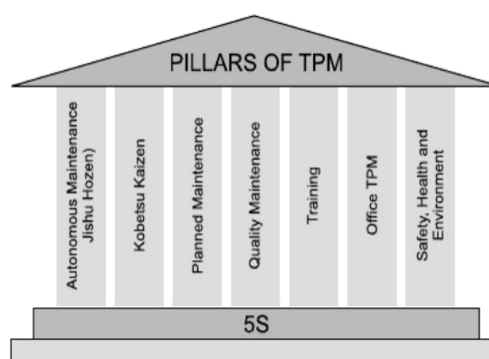
produced until it is needed.

Just-in-time manufacturing is a Japanese management philosophy applied in manufacturing. It involves having the right items with the right quality and quantity in the right place at the right time. The ability to manage inventory (which often accounts for as much as 80 percent of product cost) to coincide with market demand or changing product specifications can substantially boost profits and improve a manufacturer's competitive position by reducing inventories and waste. In general, Just in Time (JIT) helps to optimize company resources like capital, equipment, and labor. The goal of JIT is the total elimination of waste in the manufacturing process. Although JIT system is applied mostly to manufacturing environment, the concepts are not limited to this area of business only. The philosophy of JIT is a continuous improvement that puts emphasis on prevention rather than correction, and demands a companywide focus on quality. The requirement of JIT is that equipment, resources and labor are made available only in the amount required and at the time required to do the work. It is based on producing only the necessary units in the necessary quantities at the necessary time by bringing production rates exactly in line with market demand. In short, JIT means making what the market wants, when it wants, by using a minimum of facilities, equipment, materials, and human resources.

### C. Total Productive Maintenance

Machine breakdown is one of the major headaches for people related to production. The reliability of the equipment on the shop floor is very important because if any one of the machines is down the entire shop floor productivity may be nil. The tool that takes care of these sudden breakdowns and awakes maintenance as well as production workers to minimize these unplanned breakdowns is called total productive maintenance. Total Productive Maintenance (TPM) is a maintenance program, which involves a newly defined concept for maintaining plants and equipment. The goal of the TPM program is to increase production, increase employee morale and job satisfaction.

TPM is set of tools, which when implemented in an organization as a whole gives the best utilization of machines with least disruption of production. The set of tools are called pillars of TPM and they are shortly described here and illustrated in a TPM diagram.



## V. LITERATURE SURVEY

Just-in-time purchasing (JITP) as the purchase of goods such that their delivery immediately precedes their demand, or as they are required for use. The idea of JITP runs counter to the traditional purchasing practices where materials are brought well in advance before their use. Under JITP it is necessary to have a small number of qualified suppliers[1]. Discrete operations are those that are performed on a single unit or a group of units simultaneously. These include operations like metalworking, assembly, finishing and packaging. On the other hand, continuous operations are those in which the operation does not produce distinct or discrete units[2]. Involvement is most effective when organizational members are organized into teams. Organization can measure the result of empowerment only when the entire organization is willing to work as a team. Even leading companies have recognized that, in the long term period

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of time, they will surely support customers further by delivering higher quality products at the lowest possible cost[3]. Minimal critical specification: In LP, control is exercised by the standardization of work processes, whereas in STS the leading co-ordination principle is the standardization of skills. LP opts for fixed pace and standardized working processes whereas STS tries to give workers autonomy over work pace and work methods[4]. Just-in-time is a tool that enables the internal process of a company to adapt to sudden changes in the demand pattern by producing the right product at the right time, and in the right quantities.

JIT utilizes what is known as a “pull system”. Customer demand, which is the generator of the order, sends the first signal to production. As a result, the product gets pulled out of the assembly process [5]A company must have an integrated supply chain starting from the front (suppliers), through the middle (manufacturers and distributors), to the end (customers). Here “integrated” means that coordination and cooperation must be achieved in each and every part of the enterprise as a whole, as opposed to looking for individual pieces only, so as to reduce the cost of the whole system. Thus total cost and waste starting from transportation and distribution to raw material, work in process, and finished goods must all be minimized[6]. Poka-yoke ensures that an error does not occur in the first place. The research study reviewed the various dimensions of Poka-yoke as a quality tool and as a mistake-proofing device[7]. This paper highlighted that the Lean is not only tools and techniques, but it should be viewed as a philosophy. It is a 'way of thinking' and not a mechanism to action these thoughts. Lean viewed as a philosophy[8].

## VI. CONCLUSION

This paper showed that Lean Production is worth to notice that all stakeholders are trying to reduce water, energy, raw materials and environmental wastes, in a trend which satisfy all. Lean principles and tools like VSM, 5S, Kaizen, TPM, poka-yoke mechanisms or others, are used to achieve this trend by diagnosing, measuring, improving and supporting the sustainability of production systems. Furthermore, using the principles, a Lean culture is developed permitting engage people in a continuous improvement. Textile industries are also trying “walking the talk” and are doing some changes to the conventional processes. This was exposed through a significant number of projects already in progress allowing to the companies walk on the right way. LP could help achieve this sustainable development and help to aware for the biggest barrier to sustainable development that is resistance to change. This paper presented some proposals of what can be done in Textile and Clothing Industry; nevertheless these can be applied to all industries and services. With this review, it was possible to identify the need of a proper methodology that will link all these “loose ties” and proper lean tool required to improve production system in the organisation .

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