Implementation of Lean Manufacturing System in Apparel Industry

By:

B. Senthil Kumar & Dr. V.R Sampath

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B. Senthil Kumar

Consultant ILFS CDI Ltd

&

Dr. V.R Sampath

Principal NANDA Engineering College

Introduction:

Initial days garment manufacturing systems were developed to approach the mass quantity of garments in the product line, which means fully utilizing the capacity so that more products were produced by fewer workers and machines, however large queues of process inventory has been ignored. But workers and machines never had to wait for product, which minimized the production cost.

Over a period of time business could not be profitable with the conventional mass production system because of lower quantity value added products are expected to produce by the Industry. In today's scenario, customers are expecting different varieties of product which are also expected to be delivered to their end quickly, which ultimately minimizes the "order to delivery" cycle

New challenges for apparel industry are to produce lesser quantity in minimum lead time. Mass production helps everyone to cut the cost while producing mass quantity. Whereas Japanese Lean system describes how to cut the cost while producing small quantity.

Before Apparel manufacturing activities are done is mass level

What is Lean manufacturing?

Lean Manufacturing is a systematic approach for eliminating the process waste through continuous improvement.

Waste: From the customers' point of view process waste is anything which does not contribute the product transformation that is all the ***non value added activities*** in the process line is known as waste

Traditional Garment manufacturing process:

- Effective utilization of capacities which results more products were produced by lesser number of worker & infrastructures.(progressive system)
- Work in process in very high around 3000 pcs /line
- Workers & Machines need not wait for the product

- Product spends more time in manufacturing just waiting
- Garment defects are very high.
  This system is not suitable in today's scenario

The flowing table will differentiate the Lean production system in to Mass production system

Activity	Mass production system	Lean production system
Production type	Stock production	Custom production
Layout	Functional Layout	Product Layout
Inventory level	High level	Low level
Suitability	Suitable for High order quantity	Suitable for low order quantity
Higher Product design	Not Suitable	Highly suitable
Cost of Production	Higher level	Low level
Bundle Size	Lower	Higher
Process waste	Higher	Lower
Product Inspection	Sample Based inspection is possible	100% Inspection possible
Work In progress	High	Low

Advantages Lean System in apparel industry

- Waste Elimination
- Work place Standardization
- Effective plant layout
- Quality will be enhanced at source level.
- Increase the Productivity by 30% from the existing level.
- Reduction of Production cost & other Overheads
- Reduce the Risk of non compliance and Late Delivery.

Tools & Techniques Involved:

1) Quality control Tools
2) 5S
3) Just in time
4) Kanban
5) Kaizen

1. Quality control Tools involved in lean manufacturing process:

The following Quality control Charts are utilized for Lean Management

- Pareto Chart
- Fish Born Diagram
- Histogram
- Control charts
- Scatter Diagram

2. 5s system:

These 5 Tools are utilized for Workplace Standardization

- 1.Seri(Sort)
- 2.seiton(Straighten)
- 3.Seiso(Shine)
- 4.Seiketsu(standardize)
- 5.Shitsuke(Sustain)

3. Just In time (JIT)

This tool is one of the important tool for LEAN manufacturing .It defines the PULL Demand model instead of PUSH Demand model in earlier system which is mostly control the following activities

1. Purchase 2.Production 3.distribution

4. KANBAN:

This is also another important LEAN Manufacturing Tool. Which will mainly focusing on over production

5. KAIZEN:

It is a non ending effort of improvement throughout the process.

Application & Implementation of LEAN for Apparel Industry :

Process waste control involved in Garment Industry:

An apparel industry is having various process wastes .Which are mainly affects the productivity of the garment manufacturing as well increase the cost of production.

- over production
- Excessive product waiting time
- Transportation waste

- Excessive inventory
- Over processing
- Waste of motion,
- Defective product.

Approaches to Implement the Lean Production system in apparel industry

The Following approaches will convert the apparel industry in to Lean based Production factory. These approaches will be met through Effective Utilization of above said LEAN TOOLS.

1. Minimizing the required inventory level

2. Zero down the defects

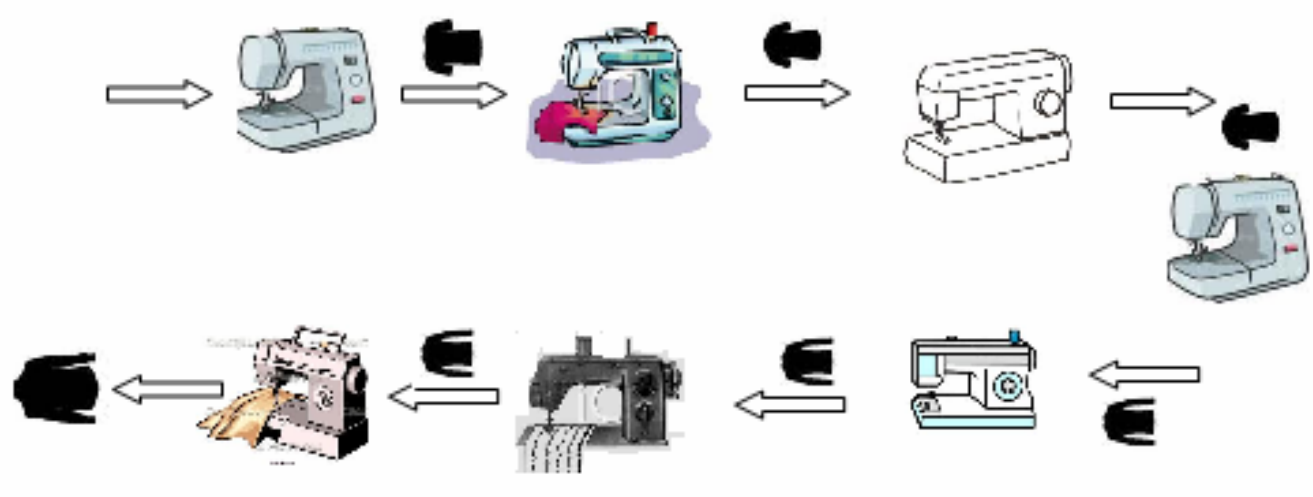
3. Reduce the process lead time (WIP)

4. Minimizing the production cost

5. Continous process improvement

Develop the New ergonomics (Work cell)

Work cell is normally smaller than usual working department, which contain 3 to 12 peoples and 5 to 15 work station are arrange which is usually U shaped layout .Generally this U shaped layout is organized around the product which in turn minimize the WIP in to 1



This Cell can be replaced by normal assembly line system which contains 60 to 70 machine for making particular product .As ideal work cell is set up to produce narrow range of similar product accordingly all the necessary equipments and resources are arranged.

Cultivation of TEAM Work:

All these days apparel production were done through Progressive bundling System(Assembly line),which never given opportunity for the operator to work like TEAM. But This modular U shaped Production system has designed to make operator as One TEAM which helps them to trouble shoot the bottleneck operation, Quality improvement, higher productivity.

Rapid production setup:

Now a days Customers are expecting to high quality garments at low price range moreover quantity of each style is very less(<500 pcs) and customer is also expecting to complete the production within 2 to 3days time, for achieving this target modular production system (U shaped layout)with the application of lean is very useful.

Since the Lead time is very less we cannot go for Progressive bundling system because the Line setting time itself takes 1 to 2 days .where as Modular system can be rapidly developed (with in 1 hour time) execute the production intime.

Application of KANBAN (PULL for Production):

As per the KANBAN tool no excess production in the process. Raw material should be pull back for production .Example

In cutting department we are usually store the excessive cut panels for next couple of days which leads excessive cutting production Which in turn cost Excessive inventory .But Using this KANBAN Tool we can restrict cutting production and need based cutting process will be initiated but this activity should not stop the Sewing production at any point of time .This system gives flexibility for quick style changeover as well minimize the Inventory.

In Sewing Line between two operations generally Bundle sizes are up to 30 pieces . Going through the entire sewing line almost 2000 pieces are waiting for production. But we cannot completely eliminate this WIP but minimize as much possible. Otherwise to set up a new production system like “MODULAR “, which can easily minimize the WIP.

In Finishing Sections like Trimming, Checking, Ironing & packing also the same procedure should be maintained which means the Product should not wait for production.

Application of KAIZEN:

Continuous Improvement can be applied in all the garment manufacturing operations .From cutting to finishing various places are available for improvement .Ex

- Improve the fabric handling practice while sewing.
- Reduce the Sewing pucker.
- Stitch & Seam failure can be controlled through continuous improvement
- Minimizing the Standard Minute value for a given garment

Once the new standard has been created ,the factory floor must follow it in addition to this KAIZEN activity should be done continuously.

Conclusion:

Due this change business environment, custom made products are becoming popular. Lean manufacturing system will surely helps industry to face these challenges

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