



Productivity Improvement in Indian Garments Industry through Lean Manufacturing Kanban Tool

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ABSTRACT

Abstract Lean manufacturing is a totally process improvement technique that focuses on eliminating non-value added activities to improve productivity through as continuous improvement by minimizing cycle time, inventory level. that's the waste discount technique in commercial segment. Most of the conventional garment industries are going through troubles like longer lead time, terrible line of balancing, transform and rejections, low flexibility of fashion changeover etc. on this studies paintings those troubles have been addressed via the implementation of Lean production approach like VSM and kaizen standards. on this paper, quick overview of idea of VSM and kaizen standards and its implementation in stitching segment of garment enterprise to enhance cycle time through editing its format via the assist of kaizen approach to enhance its productiveness is highlighted. The mixture of fee flow mapping (VSM) and kaizen to enhance the strategies is mentioned in detail

Keywords – Lean Manufacturing, Value Stream Mapping, KANBAN, Kaizen, Line Balancing, 5S

INTRODUCTION

Manufacturing becoming more competitive in market, there is a need of global efficiency in companies. for which increasing labor cost and decreasing operating costs are normal options. to put off all waste in production strategies are wished in modern trends. Due to Today's international monetary factors, and improved opposition within side the market, the client needs are greater with numerous volumes. Without growing the charge of the product the competitions with the competition are tough task. For the agency productiveness, this will best finished via best lowering non cost delivered sports in production manner with the aid of using adopting new production strategies like lean production, Just in time, deliver chain control and international elegance production, agile production etc. maximum of the time studies makes a speciality of massive scale industries however in case of small scale specifically in fabric industries are scarce and additionally only a few courses are addressing (1) . specify client cost, become aware of cost circulation, make clean cost flow, pull cost and pass closer to perfection ideas to outline lean concept (2). the body paintings for fabric enterprise via lean precept is explored and described client pleasure in higher manner (3). The powerful lean equipment like VSM and kaizen are the exceptional answers for the above stated troubles to growth the productiveness. In order to clean visualisation in which waste takes place with inside the manner, a cost circulation map (VSM) is drawn .Value circulation mapping are regularly used to evaluate modern production tactics in addition to create ideal, destiny kingdom tactics. and in case of Kaizen approach a non-stop development is viable because of small modifications in manner sports in any production sectors both small and medium and additionally even massive scale enterprises. additionally with out doubt. on this studies paintings with the aid of using the usage of those lean strategies the removal of wastes in manner is viable because of which, the lead time discount and higher productiveness with better client pleasure is proven with appropriate case look at in fabric enterprise.

THEORETICAL FRAMEWORK

The need of essential tool to solve the waste exists in manufacturing process is Lean Manufacturing technique. The main goal of the lean concept is reduction in waste and to achieve minimum lead time this will make the company leaner and more flexible also (4). Initially, lean" become defined with inside the -e book 'The Machine that Changed the World' and with inside the starting of 1990s. The LM idea have become the maximum appealing opportunity production philosophy which can perform on day by day foundation and additionally motivation for the boom and survival of the agency. The definition of waste inside lean in all fairness consistent, and a not unusual place view is that it builds on 3 fundamental categories. Muda, Muri and Mura defined as waste, meaning an activity that does not add any value, overload systems and overload of systems and humans and there is variation in a system, e.g. uneven demand respectively. Lean can be defined in terms of two perspectives one is on components or elements and other is different approaches on concepts, methods in the process. The idea of Lean is to eliminate waste or non-value added activities as it came to be known later. Which is a philosophy developed by Toyota in 1950s to compete against the US automotive sectors. the success of companies depends of lean management concepts like employee commitment, new practices and their implementation. Many papers have proved the details of benefits with Lean adoption to a system such as reduction in lead time, Work in Process (WIP), Manufacturing time, cost reduction in inventory etc. (5). In this research work, the detailed demonstration is made through the lean manufacturing techniques to a garment industry. The suitable case study is detailed along with VSM and kaizen implementation to the process

Literature Review

In recent years, many literatures have extensively studied and documented the lean manufacturing implementation, since from 1990's lean manufacturing is a conceptual frame work and many authors have proved that, the lean concepts drastic amount of productivity increase with minimum amount of waste occurred in the company. Usually, Lean manufacturing concept aim is to eliminate seven forms of wastes, reduction of lead time, process inventory, and production cost in manufacturing process. This is a quality improvement programme. Companies such as Dell, Toyota, Ford, Pratt and Whitney, Sikorsky, Delphi, Ford and many other companies have achieved large savings and improved productivity by adopting lean principles in their manufacturing activities. The proper implementation of lean technique manufacturing flexibility (6). The all types of wastes are identified through the application of VSM (value Stream Mapping). (7) Presented a case study of VSM in an Indian garment export industry to evolve and test various strategies to eliminate waste and to improve the productivity. With the idea of VSM technique the author has reduced the lead time and improves company maintenance in press parts production (8). Then, Kaizen is used for continuous improvement of the minimization of sewing defects in Apparel Industry in Bangladesh and The results before and after implementation of kaizen is really fruitful in form of productivity (9). The mapping purposed to know all waste in value stream and took a step to lean application case study successfully (10). In this work, description of VSM and Kaizen principles are highlighted with the textile case study, here the work process across the Value stream is studied for finding value added and non value added activities and kaizen application is performed through the modification of process layout to achieve the productivity is the main intention of this work. i previous years, there were many illustrations on application of VSM and kaizen to other SME,s except textile industries but rarely addressed the application of VSM and Kaizen in textile industries to minimize the waste in their process.

RESEARCH APPROACH

The initial step in this research is to systematically study and define the history of the lean manufacturing concept and its different tools and techniques especially on VSM and Kaizen principles. This will be followed by the study of the existing production system, movements, layout, inventory movement systems, work balancing methods and other different variables which needs to be improved for the betterment of the existing system. the main investigation is made on application of lean manufacturing concepts in textile industry, where empirical data were collected, according to the scope of the studies was defined on operational level basis and which is came to know that, the previously very little research has been conducted in this particular textile area. as per the scope of the study, applying lean manufacturing principles in the selected context through which the productivity improvement is highly possible by little changes in the work atmosphere is highlighted with proper case study approach. hence the better result in the process is going to achieve.

Data collection

In the current layout of sewing section is processing jackets for both men and women. Here loading, subassembly and checking operations are most important. And there are some non value added activities are occurred in this process while studying. These are treated as wastages that must be removed from the process are the main organization task. In this regard, application of VSM and Kaizen

Principles are considered in this work. The detail layout of fabric section is shown in below Fig. 3.1

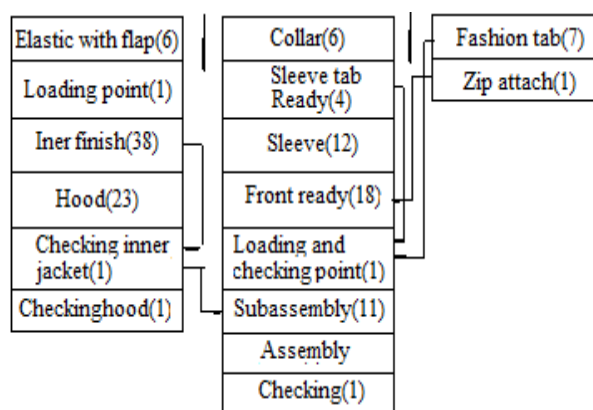


Fig.1: Current layout of sewing section

The above Figure shows the detailed layout of sewing section from starting point to loading and checking point. Here the 1058 jacket is preparing with 154 workstations in 130 minutes of operation cycle time, where, the waste occurred as 30 seconds for 1 jackets out of 200 jackets prepared per day and related 1 hr 40 minutes (110 minutes) is the wastage time. The most of the wastage time is due to improper arrangement of workstations between fashion tab and loading, unwanted movements made by checker for checking inner jacket.

Kaizen application

The continuous improvement is made through the application of kaizen principle the same is achieved by the modification of layout as fallows.

- Installing front ready before sleeves and collar adding that fashion tab and zip attach near front ready and collar.
- Installation of checking table in between the hood and inner finished can eliminate the wastage of time (30seconds) for an average of 10jackets.
- By reordering the work stations front ready, collar, sleeve tab, sleeve, fashion tab, zipattach, in the proposed line design we will save 1minutes for an average of 4jackets

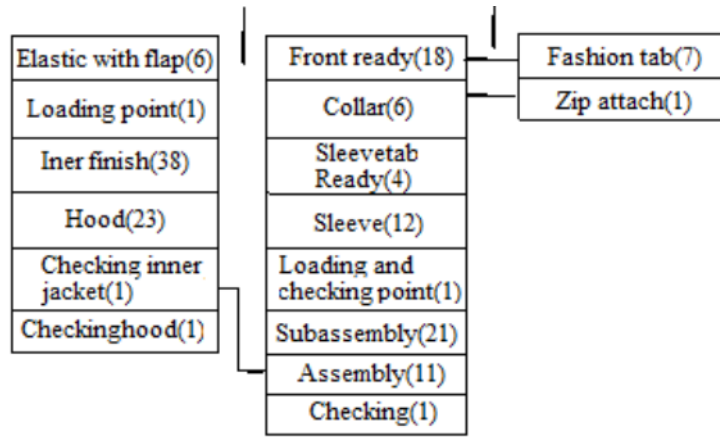


Fig.2: Proposed layout of sewing section

The modification of sewing operation layout the major changes is fashion tab to front ready instead of fashion tab to direct loading then checking then zip to collar instead of zip to loading and checking which saves two operation in the view of time saving and its sequence so the cycle time saves up to 50% compared to earlier sequence before modification is made. Which is towards the time saving and the productivity so that the both the changes are described in the above figures.

RESULTS AND DISCUSSIONS

After the application of kaizen principle through the modification of layout for the sewing section of 1058 jacket the 15 seconds per jacket is saved and totally for 200 jackets 84 minutes have saved successfully. Due to which the cycle time for the sewing operation is reduced from 110 minutes to 84 minutes and the number of garments output is increased from 220 to 247 per day is the achievement of productivity and the same results are shown in the below graph figures 3 and 4 respectively.

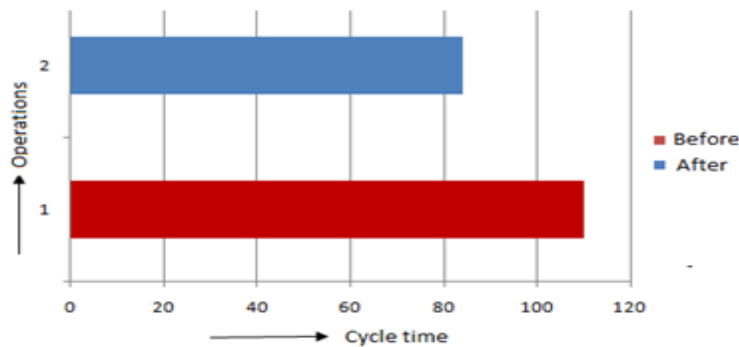


Fig.3: Cycle time reduction

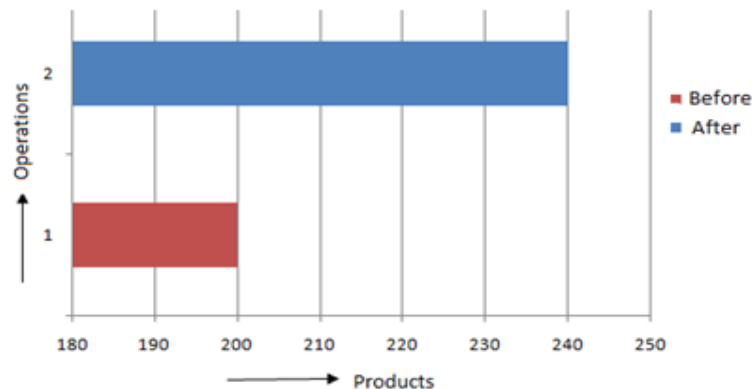


Fig.4: Productivity improvement

CONCLUSION

In this research work the implementation of effective lean manufacturing technique like kaizen is implemented in garment industry. Before that the study of layout analysis is made in sewing process. finally wastes are occurred. To reduce these waste the implementation of lean concept like kaizen is preferred. Generally lean based production increases the profitability and reduces lead time. But the aim behind to induct lean in waste management is to reduce the waste existence of the textile industries. Eventually some paper proposes the lean based waste management for the

textile industries. The lean principles are well suited for reducing and managing the industrial waste as a future work the additional lean concepts and principles are considered to manage the industrial wastages. finally, the wastes are identified and reduced by the modification of sewing machine layout. hence, in this work, the reduction of operating cycle time and improvement in productivity is obtained clearly. in this way, application of lean manufacturing technique like kaizen is one of the effective tool to small and medium scale organizations to achieve their productivity without changing the organizational infrastructure.

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