

A Study on Power looms by Management Intervention: 5s Philosophy

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Abstract

For a society or a nation to raise the standard of living of its population, it must strive to maximize the return from all its resources so that the economy can grow and sustain a better quality of life. This calls for sustained efforts at improving productivity of all investments. Productivity in the individual enterprise may be affected by a series of external factors as well as by a number of deficiencies in its operations or internal factors. Example of external factors include the availability of raw materials and skilled labor, government policies towards taxation and tariffs, existing infrastructure, capital availability and interest rates, and adjustment measures applied to the economy or to certain sectors by the government. These external factors are beyond the control of any employer. Other factors, however, are within the control of managers in an enterprise and these are the ones that will be tapped.

Keeping this as a backdrop, this paper attempts to increase the productivity in the Solapur (Maharashtra) based yarn dyed jacquard terry towel power looms, many of which are small and medium scale units. The study aims to identify different management techniques which can be applied and these may be unknown to the traditional business owners.

This paper examines the Basic Work Content and ineffective time. By applying the management techniques of Work Study, the ineffective time is sought to be reduced by giving a time series consultancy for five power looms and the productivity is increased by considering the key areas like factory operations, quality control, inventory, planning, human resource management and sales, order management. Solapur is a unique city in manufacturing the yarn dyed jacquard terry towels where the export quantity is high. The paper deals with one management intervention which is inventory and the causal impact of inventory on productivity.

Key words: Power looms, 5 S, Management Intervention, Inventory Control

Introduction

The textile industry plays very important role in Indian economy. It ranks second after the agriculture. Besides the industrial production, it provides employment to millions of the people of the country and gives a handsome earning of foreign exchange through export. It is also source of livelihood in villages and remote areas. Millions of people in our country depend directly or indirectly upon the textile industry. The rapid growth and development of this industry in the five decades after independence is remarkable. Power loom is a decentralized and labor intensive firm. In Maharashtra, about 95% of the total power looms are located in five major clusters i.e. Bhiwandi, Malegaon, Ichalkaranji, Solapur & Nagpur. Out of 11.06 lac power looms 10.47 lac power looms are located in these five major clusters (Anjum et al., 2011). According to the statistics by Bombay Textile Research Association (BTRA), more than 18,000 thousand power looms are in existence at Solapur (BTRA, 2012). The firms operate in a very traditional way and seems to be operating with very low profits.

Literature Review

Bloom et al. (2010) run a field experiment on large textile firms at Mumbai in India to evaluate the casual impact of management on performance. They have provided consultancy to a randomly chosen firms. These firms were either unaware of many modern management practices or did not have know how to implement them. Examples of such management practices include key principles of Toyota's lean manufacturing such as the implementation of systems for regular maintenance and repair of machines, continual analysis and refinement of quality control procedures, inventory management and planning, and human resource practices such as performance based incentives.

Anjum and Thakor (2011) have analyzed that there is no proper marketing mechanism in the power loom industry in Malegaon. It was observed that the price of the yarn and fabric always fluctuates. Sometimes it goes inverse direction that means the prices of the yarn increases while the price of the fabrics goes in down direction. As the majority of the weavers are job work weavers so they cannot afford buying yarn and marketing of the cloth. Middlemen enjoy the main profit and they also exploit the weavers who are unorganized. The owners of power loom units failed to provide basic amenities to the workers. The majority of the workers are not satisfied with the working conditions of the factory. They are working with dust and fumes, no proper lighting and ventilation, ignorance of cleanliness, no care on hygienic conditions and no safety measures to avoid accidents.

Their jobs are unsecured and majority of the workers are not satisfied with their jobs in terms of welfare facilities and wages.

Pankhania and Jani (2012) have analyzed the impacts of globalization and competitiveness on productivity. It is interesting to know that almost everybody is in the opinion that globalization has changed the present industrial scenario, and it is the demand of the day. The set attributes regarding globalization, liberalization and privatization, ISO, VRS, job stress, all attributes have their own effect on the industrial performance. The five factors uncover the associations of the 16 attributes. These factors contribute the market penetration leading to higher productivity of the organization.

Chummar et al. (2013) note that to exist in a competitive world, producing products at a low price with good quality is necessary. Accepting new technology, the production cost can be reduced, at the same time the rate of production can be increased. This study identified the problem of high energy consumption of electricity by the usage of shuttle looms in a garment industry. It suggested a remedy of replacing the aged shuttle looms with the automatic 'rapier looms' for increasing the rate of production, thereby reducing the time of operation of machine and reducing the total lead time in production. Thus cost of production can be reduced. By rectifying other reasons noted in the cause and effect diagram production rate can be again improved. Further studies on the rapier looms can be helpful for the multi color weft insertion which will increase the variety of product according to the fluctuation market conditions.

Research Background

Solapur power sector is currently under pressure to become more competitive. More traditional power looms are facing the problems due to imports. (Chammar et al.2013). The number of traditional Power loom is about 18000 and the imported power loom cluster is 547. So, the sector needs to develop by improving quality and increasing productivity and sustain in the era of globalization and competition. (Pankhania et al.2012)

The Textile Committee has stated

1. The Solapur power loom firms suffer from inadequate level of skills and knowledge related to quality, productivity, finance and marketing.
2. There is a severe need to reduce the operational costs by way of process and productivity improvement and through optimal use of input.

Statement of the Research problem

Against above mentioned background the research problem to be researched within the power loom sector is lagging in the area of industrial engineering.

Objectives of the Study

Considering the importance of the terry towel industry, it is proposed to carry out the studies in and around Solapur city for "Yarn dyed Jacquard terry towels on power loom". The scope of research is limited for Small and Medium Enterprises (SME). The objectives of proposed study are as follows:

- 1) Identification of different Management Techniques which may govern the productivity of Textile Industries in and around Solapur city.
- 2) Introducing the Management Intervention to improve the performance of a Power loom.

Research Questions

a) Why work with firms in the Indian (Solapur) Textile Industry?

It is observed in the Power looms at Solapur that the success rate is low in terms of profit and productivity and many units are becoming sick. The ratio of sick units is more than 35% (Textile Development Foundation, 2009). The 'jacquard terry towel power looms' survival is somewhat more as compared to chadder manufacturer because the export component is high and the local orders are also good as Solapur is the unique in manufacturing jacquard terry towels. So, the intervention of management is required to these looms which are working traditionally with low productivity and it is visible based on the methodology of manufacturing.

b) Why use Management consulting as an intervention?

As pointed out by Bloom et al. (2010), the following could be the factors that attract management consulting as an intervention: (a) Factory Operations (to increase output), (b) Quality Control (to increase quality and reduce rework), (c) Inventory (to reduce inventory levels), (d) Planning (to increase output and improve due date performance), (e) Human Resource Management (to increase output), and (f) Sales and Order Management (to increase output and improve due date).

c) Selection of number of firms for field experiment:

The five yarns based jacquard terry towel power looms are selected to do the study.

The Management Intervention for Inventory Control

The time series intervention is given to five firms by using a lean manufacturing. The 5 S philosophy is adopted on inventory control and the results of two firms are plotted in figure .1 and figure.2.

5 S Philosophy

Phases of 5S

There are 5 primary phases of 5S: sorting, straightening, systematic cleaning, standardizing, and sustaining. Additionally, there are three other phases sometimes included; safety, security, and satisfaction

5S – Summary Chart

The 'S'	Meaning (Japanese)	(What is involved)	Objective
1 'S'	Seiri - Sorting Out	- Segregate necessary from unnecessary - Remove what is not required - Decide on frequency of sorting	- Saving and Recovering Space
2'S'	Seiton - Systematic Arrangement	- Arranging in order - A place for everything and every useful thing in it's place	- Minimizing search time - De-cluttering the Workplace
3'S'	Seiso -Spic and Span	- Clearing the work place / equipment - Ensuring – Tip Top Condition	- Inspecting for problems - Taking corrective actions, faster
4'S'	Seiketsu - Standardization	- Working methodology (procedures and work instructions)	- Achieving higher productivity and better quality
5'S'	Shitsuke - Self Discipline	- Forming the habit - Training - Be disciplined	- Doing it Right first time and every time

Field Observations and applying 5 S for Inventory

- a) Inventories were much disorganized, so that firms typically had more than a year of yarn inventory in some firms. Different types/colors of yarn were lying mixed. Yarn was lying around without labeling or in any sort of order.
- b) Similar situation was for spares- these could often not be found or were damaged. Spares were kept without any labeling or order. There was no protection to prevent damage or rusting.
- c) Organizing spares reduces downtime (since parts can be located quickly), capital stock and waste. Parts like gears, bushes etc. need to be sorted as per specifications. Fastening elements are to be sorted as per specifications.
- d) Organizing inventories enables firms to reduce capital stock and reduce waste (yarn rots). Inventory calculation is now done on daily basis.
- e) Mixed color yarns are separated. Yarn labeling is done and kept in order.
- f) Location, type and age of yarn are marked by a display at store.
- g) Shade card are produced for all surplus yarn and sent it to design which can be utilized in future for similar design.

- h) Spares are protected and labeled.
- i) Suggested for ERP Software.

Effect on Inventory Level

After the above management intervention, it was seen that the inventory levels started falling as shown in Fig. 1. The daily usage of the inventory is 12 to 15 kg. The cost of yarn is Rs 220/-. The power loom work for only one shift. The stock of yarn is unknown to the owner. During the month of April 2013 the stock was 3600 kg. The project start was in the month of April and the data is collected. The intervention was during the end of May 2013 to first week of July 2013. During the May 2013 and August 2013 once again the inventory level was increased due to new order from South Africa through the agent. After the intervention it is observed that the inventory was slowly falling. More or less the intervention has worked for all five firms. Fig. 2. shows the inventory level for firm B which is in control as per the requirements.

Fig.1. Effect of Management intervention on inventory level for firm A

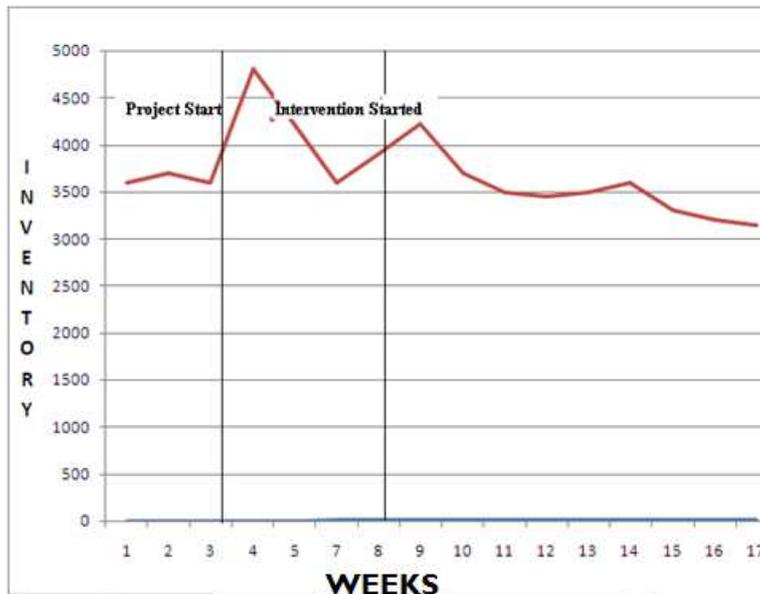
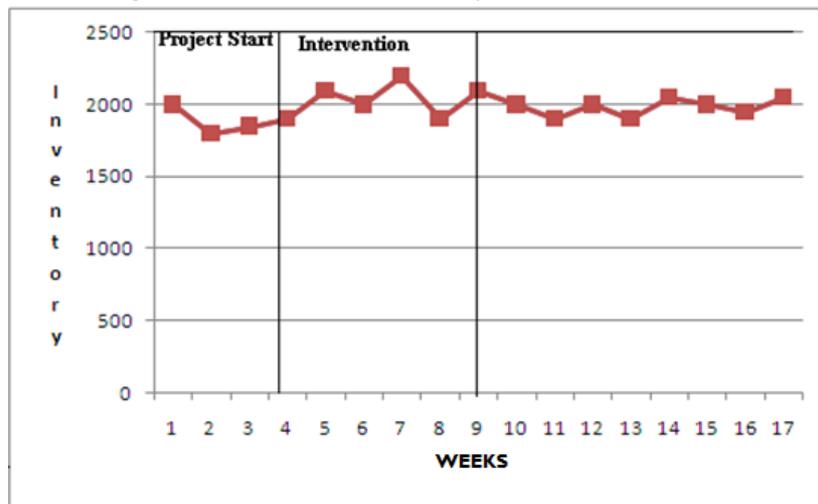


Fig.2. Effect of Management intervention on inventory level for firm B



At firm B, the effect of intervention on the inventory is shown in Fig. 2. In firm B there is no specific significant change in the level of inventory as compared to firm A. The management intervention has made the firm to reorganize the parts to its specific location. 1 to 17 indicates weeks in the month of April 2013 to August 2013.

Conclusion

This study reports the results of implementing an industrial experiment which gave “managerial consulting” services to select yarn dyed jacquard terry towel power looms. The selected looms were much disorganized and unaware of management interventions and inventory management. This paper only dealt with the inventory control and shows the results obtained in reducing the level of inventory. The other management interventions are in progress. It is observed that there is a cost saving and reduction of inventory levels and wastage which leads to the better productivity of the power looms.

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