

ADAPTING LEAN MANUFACTURING PRINCIPLES TO TEXTILE DYEING MACHINE MANUFACTURING INDUSTRY

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Abstract—

A research project was conducted to determine appropriate principles for implementation of lean technique in the industry of textile. Lean manufacturing involves a quiet a lot of techniques and principles, with the suitable ultimate goal: to minimize waste and non-value-added activities at eachservice or production process in order to attain the most satisfaction to the consumer. To be competitive, many textile manufacturers have improved their manufacturing process so that they can readily compete with other manufacturers. The study identifies the different techniques and principles of lean. The use of lean manufacturing in the textile industry was examined in this paper through brainstorming, industrial visit and suitable case studies. A model for implementing lean tools and principles in a textile environment was developed.

Keywords— Textile industry , 5's system , Kaizen system Tools and Technique, VSM

The present problem in the industry is contributing the major delay in the process due to poor material handling , required tools are not in proper place for workers. So ,that the process takes too long than the normal time. Unofficial Communications between Mechanical and Electrical workers takes place. Due to this the cycle time and non value added activites are increased.

III. OBJECTIVE

- 1) To improve the productivity level of dyeing machine with increasing in value added time
- 2) To eliminate the non value added activities present in assembly line.
- 3) To Implement 5s system to reduce the waste & maintain the work place.
- 4) To implement KAIZEN for reduction of defective parts.

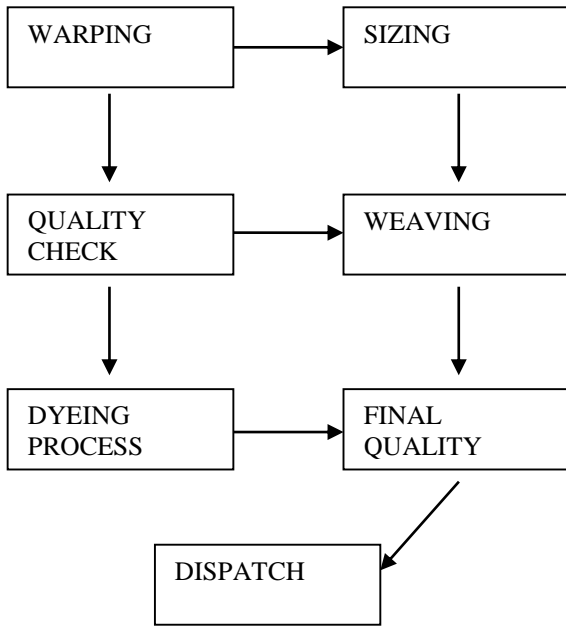
IV. PROCESS MAP AND METHODOLOGY

I. INTRODUCTION

A. Company profile

SPI equipmentsPvtltdlocated in nachipalayamCoimbatore.ThePlant is equipped textile dyeing machine with Make to order process .Manufacturing Dyeing Lab Equipment to textile industry to tiruppur leading textile industries.

II. PROBLEM DEFINITION



Available time = Working hours – Breaks
 $= 8*60*60 - 1*60*60 = 25200\text{sec}$
 Demand = 50 Machine/MONTH
 Takt time = Available time/ Customer demand = 14976sec

Customer order	50/month
Demand	2/day
Working hour	1shft/day
Break	1hour
Raw material	Every 15 days

Table 1 ;Data collection

V. DATA COLLECTION

VI. CAUSE AND EFFECT DIAGRAM

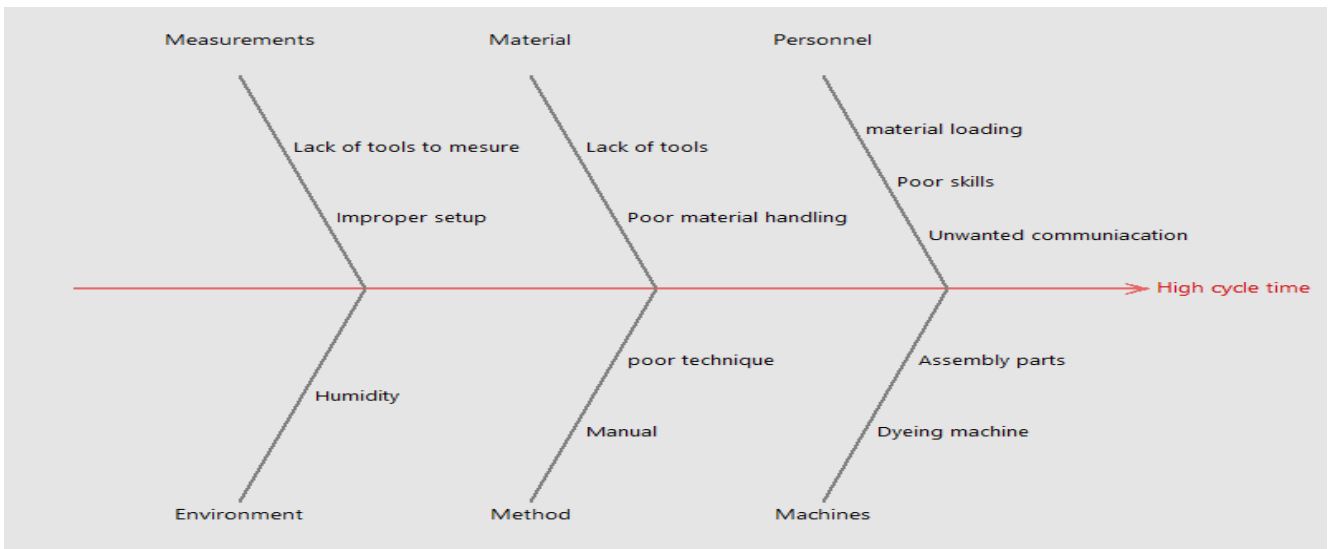


Figure 1 ; Cause & Effect diagram

VII. PDCA CYCLE

PLAN

- Problem Identification
- Objective set
- Problem characterization

- Causes of the problem
- Action plan

DO

- Infrom those involved in the implementation plan
- Established plan – 5’s , KAIZEN , VSM etc,...

CHECK

- Throughout the execution, check constantly. If the plan

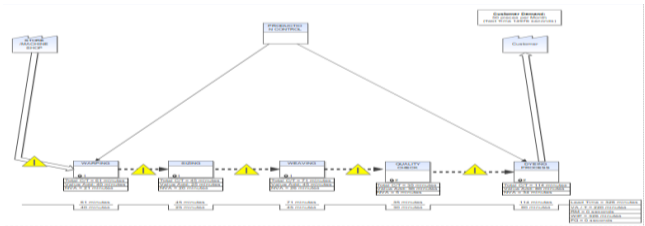
is being fulfilled and if there are no unforeseen circumstances that simply change the same.

- Then verify the plan as fulfilled and the objective reached.

ACT

- Try to apply the same action plan in other area also, in order to promote the organization.

VIII. VSM CURRENT STATE



VII. VSM INPUTS

PROCESS	CYCLE TIME in min
Warping	61
Sizing	45
Weaving	71
Quality Checking	35
Dyeing Process	114

Table 2 ; VSM Inputs

IX. LEAN TOOL IDENTIFICATION

5'S

- 1) SORT
- 2) SET IN ORDER
- 3) SHINE
- 4) STANDARDIZED
- 5) SUSTAIN

KAIZEN

- 6) SYSTEM or FLOW KAIZEN - Focuses on the overall VSM
- 7) PROCESS KAIZEN- Focuses on individual processes

- 1) 5's implementation(Mechanical station)

Before



Figure 2 ; 5's Before

After



Figure 3 ; 5's After

2) 5's implementation(work station)

Before



Figure 4 ; 5's before

After



Figure 5 ; 5's After

3) KAIZEN SHEET 1

Before	Suggested solution	Responsible
PROBLEM – Rejection LOCATION – Rejection Area	SOLUTION – 1) Red tag area 2) Clean area and resue the parts in all departments.	Supervisor

Table 3 ; kaizen sheet 1

4) KAIZEN SHEET 2

Before	Suggested solution	Responsible
PROBLEM – grinding LOCATION – Mechanical station	SOLUTION – 1) Red tag area 2) Clean area and resue the parts in all departments.	Operator/ Employee

Table 4 ; kaizen sheet 2

X. RESULTS AND DISCUSSION

PROCES S	BEFORE IMPLEMENTAT ION (min)	AFTER IMPLEMENTATI ON (min)
Warping	61	45

Sizing	45	25
Weaving	71	50
Quality Checking	35	30
Dyeing Process	114	70

Table 5 ; Result and discussion

1) Comparison

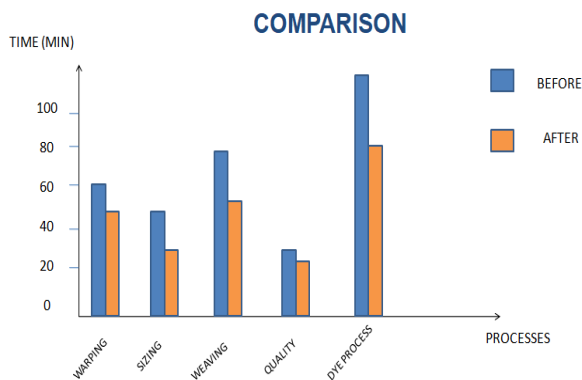


Figure 6 ; Comparison

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