

**REDUCTION OF WASTE BY USING VALUE STREAM MAPPING IN
MAQSOOD FAISAL PAPER AND BOARD MILL:**

THE LEAN MANUFACTURING SYSTEM TOOL



SESSION 2010 - 2014

PROJECT ADVISOR

MR. ABBAS RAZA

PROJECT TEAM MEMBERS

RAMISHA FATIMA	101631023
MUBEENARIF	101631035
HAMZA TARIQ	101631039

BACHELOR OF SCIENCE MAJORS IN INDUSTRIAL ENGINEERING

SCHOOL OF SCIENCE AND TECHNOLOGY

UNIVERSITY OF MANAGEMENT AND TECHNOLOGY

LAHORE, PAKISTAN

**REDUCTION OF WASTE BY USING VALUE STREAM MAPPING IN
MAQSOOD FAISAL PAPER AND BOARD MILL:**

THE LEAN MANUFACTURING SYSTEM TOOL

PROJECT REPORT SUBMITTED TO THE
UNIVERSITY OF MANAGEMENT AND TECHNOLOGY
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE
OF
BACHELOR OF SCIENCE MAJORS
IN
INDUSTRIAL ENGINEERING

PROJECT ADVISOR

MR. ABBAS RAZA

CHAIRMAN OF DEPARTMENT

MR. MASHOOD NASIR

PROJECT TEAM MEMBERS

RAMISHA FATIMA	101631023
MUBEENARIF	101631035
HAMZA TARIQ	101631039



ABSTRACT

Purpose of this report is to inform about the lean tool value stream mapping. It itself is not a strategy but imply different strategies in this tool for the improvement. It is used to differentiate non-value added activities from the value added activities. It creates an image about the material flow and information flow in products and services. Many other organizations are using this method because by using this method they come to know about their problems and improves the processes by several techniques. It includes information flow from top management to workers and from the suppliers to the customers. As lean has been developed it is being implied in different industries for the improvement of the material and service flow. In this report value stream mapping is implemented in a paper industry located near kasoor named as maqsoodfaisal paper and board mill. For this purpose firstly the six key performance factors are identified and their performance is identified and secondly different process is carried out to for the improvement of these factors. These key factors are 1) efficiency 2) waiting time 3) lead time 4) work in process 5) defects 6) transportation. When these KPI's are identified the data regarding them is collected. The current state map is being drawn and non-value added activities are being identified and are eliminated for the purpose of improvement. Lean principles are applied, solutions are presented and future state map is drawn which shows all the improvements made in the current state map. All the plans made are then implemented to achieve the future state map. Results are quantified and compared with the current state map. By the implementing of this technique the non value added activities are eliminated and effective use of the resources and removal of the wastes is done so that the value added activities are done effectively. This report also emphasizes the VSM's important role in the paper production.

ACKNOWLEDGMENT

First of all, we would like to thank ALLAH who granted us a lot in our whole career as well as in every field of life.

We also wish to extend my thanks to Assistant Prof. Mashood Nasir and other colleagues for attending my presentation session and for their insightful comments and constructive suggestions to improve the quality of this project work.

We express our sincere gratitude to our project advisor Assistant Prof. Abbas Raza for his efforts, stimulating guidance, continuous encouragement, and supervision and encouraging us to think throughout the course of present work.

Dedications

I dedicate this work to my country, teachers and my family. Feel gratitude for my parents who encouraged and pushed me to work hard and achieve my goal. Thanks to all my teachers who helped me in learning all this work and encouraged me to complete this work. I also feel great and hope that it will be helpful material for the growth of my country in industrial sector.

Table of contents:

Chapter 1: Introduction	1
1.1. Lean manufacturing.....	2
1.1.1. Lean principles:.....	3
1.1.2. Tools of lean manufacturing.....	3
1.2. Value stream mapping.....	4
1.3. Goal of value stream mapping.....	6
1.4. Sections of a Value Stream Map.....	7
1.4.1. Material flow.....	7
1.4.2. Communication flow.....	7
1.4.3. Time line.....	7
1.5. When to Use Value Stream Maps.....	8
1.6. Importance of value stream mapping.....	8
1.7. Industry introduction.....	8
Chapter 2: Literature review	10
Chapter 3: Methodology	16
3.1. Collecting the data.....	17
3.2. Value Stream Maps.....	18
Chapter 4: Current State	21
4.1. Waste from over production.....	22
4.1.1. Symptoms.....	22
4.1.2. Causes.....	23
4.1.3. Cost.....	23
4.1.4. Elimination.....	23
4.2. Waste of time in waiting.....	24
4.2.1. Symptoms.....	24
4.2.2. Causes.....	24
4.2.3. Cost.....	24
4.2.4. Elimination.....	25

4.2.5. Wait due to thickener	25
4.3. Waste of motion	26
4.3.1. Symptoms	26
4.3.2. Causes	26
4.3.3. Cost	26
4.3.4. Elimination	26
4.4. Waste from defects	27
4.4.1. Symptoms	27
4.4.2. Causes	27
4.4.3. Cost	28
4.4.4. Elimination	28
4.4.5. Defects in the industry	28
4.5. Waste of inventory	29
4.5.1. Symptoms	29
4.5.2. Causes	29
4.5.3. Cost	29
4.5.4. Elimination	29
Proposed Future State	30
Chapter 5.6S	31
5.1. Introduction	32
5.2. WHY 6S?	32
5.3. What is 6S?	32
5.4. How is it implemented?	34
5.5. Checklists to maintain the smooth environment	37
5.6. Safety precautions	39
Chapter 6: Maintenance	43
6.1. Introduction	44
6.2. Which one to be chosen	46

6.3. Preventive Maintenance Tasks	46
6.3.1. Assurance of equipment fitness.....	47
6.3.2. Basic care of equipment inventory.....	47
6.3.3. Maintenance of critical equipment.....	48
7.3.4. User involvement with the equipment care.....	48
6.4. Integrating disparate information system and task groups.....	48
6.5. Compiling the plan for PM task	49
6.5.1. Analyze the system, assemblies and parts.....	49
6.5.2. Analyze failures associated with the system parts.....	49
6.5.3. Tasks decision for PM.....	52
6.5.4. Assemble PM routines.....	53
6.5.5. Validating the routines and resource needed.....	53
6.5.6. Schedule the routines.....	53
6.5.7. Define the routes.....	56
Chapter 7: Method study.....	57
7.1. Introduction.....	58
7.2. Results gained from the method study.....	59
7.3. Steps of method study.....	59
7.3.1 Select.....	59
7.3.2. Record.....	60
7.3.2.1. Flow process chart.....	60
7.3.2.2. Current flow diagram.....	63
7.3.2.3. Future flow diagram.....	64
7.3.3 Examine.....	65
7.3.3.1 Purpose.....	65
7.3.3.2. Place and sequence.....	65
7.3.3.3. Person.....	65
7.3.4. Develop.....	65
7.3.5. Evaluate.....	66

7.3.6. Install	67
7.3.7. Maintain	67
Chapter 8: Payback period and Expected out comes	68
8.1. Introduction	69
8.2. Formula	69
8.3. Future state production	69
8.4. Payback period of new machine	70
Chapter 9: Conclusion	72

List of Figures:

Figure 1 Lean manufacturing.....	2
Figure 2 Lean principles	3
Figure 3 Value stream mapping.....	4
Figure 4 Value Added and Non-Value added activities.....	5
Figure 5 House of lean.....	6
Figure 6 Product information & Supply chain.....	8
Figure 7 Paper reel.....	9
Figure 8 Typical process for lean implementation.....	11
Figure 9 Project objectives.....	17
Figure 10 Overproduction.....	22
Figure 11 Time wastage.....	24
Figure 12 Motion waste.....	26
Figure 13 Defects.....	27
Figure 14 Excessive inventory.....	29
Figure 16 The 6s System.....	32
Figure 17 Old Thickener.....	36
Figure 18 New Thickener.....	37
Figure 19 Pathway for Safety.....	39
Figure 20 Safety Equipment.....	40
Figure 21 Sign Boards For Safety.....	41
Figure 22 Safety Stands.....	41
Figure 23 Fire Extinguishers.....	42
Figure 24 Emergency Exits.....	42
Figure 25 Goals of Preventive Maintenance.....	47
Figure 26 Hierarchy ofthe Whole Production System.....	50
Figure 27 Hierarchy of Paper Machine.....	51
Figure 28 Procedure of Method Study.....	58
Figure 29 Current Flow Diagram.....	63

List of tables:

Table 1 Space savings	13
Table 2 Machine waiting time.....	25
Table 3 Faults	28
Table 4 Future production.....	69
Table 5 Payback period of machine.....	70

List of charts:

Chart 1 Lead time comparison	14
Chart 2 Current productions	22
Chart 3 Time waste in mechanical faults	52