CHAPTER I
INTRODUCTION

This chapter contains the background of the problem, the formulation of the problem, research objectives, scope of the problem used in solving the problem, and outline of the report.

1.1 Background

Currently, industries in Indonesia are growing rapidly. The globalization era gives a great impact on every aspect of life, including in the industrial sector. Industrial sector in Indonesia has to be more developed since it becomes the most important aspect of developing the nation. In addition, domestic manufacturing industry sector also gives the biggest contribution to taxes and excises(setkab.go.id). Furthermore, the competition in the manufacturing industry sector requires every company to do continues improvements and develop its performance. Companies seek for ways in which to enhance the production and manufacturing processes so as to stay competitive within the market to reduce cost, enhance productivity and improve product quality (Ghaleb, El-Sharief, and El-Sebaie 2017). The ability to fulfill customer expectation make manufacturing companies be able to control the production process, working system, and others to be more effective and efficient.

In order to enhance productivity and improve product quality, the company has to know which activity increases value-added-activity, minimize waste and shorten the lead time. In the production process, if an activity does not give any value-adding activity to the product, it categorized as the waste and has to be minimized.

Lean Manufacturing is an efficient and fast-growing approach in the world of competition. Lean Manufacturing is employed for the incessant removal wastes in the manufacturing to improve efficiency and productivity. The main focus of lean

manufacturing is to satisfy customer demands for high quality and low cost (Gupta, 2017). Lean can be implemented in engineering, production, sales, planning, / maintenance, marketing, store, research & development, etc (Mehta, 2012). By implementing lean manufacturing, some benefits can be obtained such as waste elimination, reduction in reworking, financial benefits, lead time reduction and lower inventory levels (Shoeb, 2017).

One of the competitive manufacturing industries is cement industry. Due to huge and simultaneous development of infrastructure in various regions of Indonesia, in the first half of 2018 domestic cement consumption increased 3.6% while it compared to the same period in 2017 (sources: asi.or.id).

PT. Semen Padang is the oldest cement company in Indonesia that established on March 18th, 1910. PT. Semen Padang is located in Indarung Village, Lubuk Kilangan District, 15 km east of Padang city. At present, the company is under the auspices of Semen Indonesia Group (SMIG). PT. Semen Padang produces seven types of cement that use two types of packing bag which are pasted bag and sewing bag.

The pasted bag is produced by own company in the packing bag plant of PT. Semen Padang in Bukit Putus, Padang and the sewing bag is bought from the other company (external of PT. Semen Padang). Packing bag plant unit has an important role to produce the pasted bag. The plant uses two production lines for pasted bag production process, production line III uses the help of the operator to transfer the product, while in the production line IV uses belt conveyor.

The production process of pasted bag in PT. Semen Padang consists of 21 processes that begin with make a tube or half-finished bag. The process of tube making starts with the printing process of the packaging, then the printed paper rolls will be perforated in the perforating unit. The perforated paper passes the cross pasted unit and longitudinal pasted unit. This process is used to give the glue on the sides of the paper so that the tube is formed. The next step is tearing off the paper

so the paper roll will be separate into pieces. The pieces of paper are collected in a lot. Furthermore, the lot is processed into a finished bag through some stages named the bottomer process. The main process of bottoming is to make the top and bottom of the bag by folding on it and inserting a valve. Valve is used to give space at the bag's bottom that will help on the process of cement filling in the packing plant. The final products pile up in the form of lots and send into the quality control unit to do an inspection of the product's quality.

Based on the preliminary study that has been carried out in packing bag plant of PT. Semen Padang, direct observation to the plant and do interviews with the production staff, it is known that in the flow of the packing bag production process, the plant often experiences activities that do not provide added value (wastes).

Overprocessing exists in the production line. The production operators do the inspection process repeatedly along the production line. The operator on the production line does the direct inspection when they see the defective products. The defective products are transferred to the rework station and the operators do check on each of the defective product. Rework process is done by the operator by repair each of the product and the rest of the defective product will be disposed.

Operators in the production line move each lot of the packing bag into the pallet. It will result on unnecessary motions due to the ergonomics aspect when operators have to stretch, bend and pick up the bag. This activity causes the operator to feel fatigued that likely to lead to poor productivity and effect in the quality problems.

Bad production scheduling will also give bad impact on the production process. Machine downtime happens when the production process is excess than it used to be. One machine is usually used for 2 working shifts with the certain motor speed of production. But at certain condition, the production increases so the machines have to work for 24 hours which cause machine downtime and needed to

be maintained. This condition causes a waste of time. **Table 1.1** presents data of machine downtime of packing bag production.

Table 1.1 Data of Machine Downtime

Period	Line	Available Time (hr)	Tuber	Bottomer	Tuber	Bottomer
			Shift I (hr)		Shift II (hr)	
January	3	226	53,75	59,54	51,99	72,06
	4	209	59	61,09	54	57,1
February	3	205	38,68	41,66	37,09	43,22
	4	199	40	45,5	41	48,52
March	3	210	41,74	44,71	42,29	45,66
	4	198	54	99,32	55	106,67
April	3	182	60,01	64,6	61,65	66,84
	4	159	40	45,5	41	48,52
May	3	168	57,54	61,88	59,14	62,81
	4	182	119	125,67	123	126,64
June	3	156	59,79	67,55	47,12	57,98
	4	182	119	125,67	123	126,64

(source: Packing Bag Plant PT. Semen Padang)

In each working shift, the defective product is usually found in each production line. The product can be rejected because it doesn't meet the standard specification of the product, so it classified into defect waste. One example of defect waste is on the printing process. The bag design is not fit with the standards as seen in **Figure 1.1**. **Figure 1.2** shows the example of standardized design of the bag packaging.

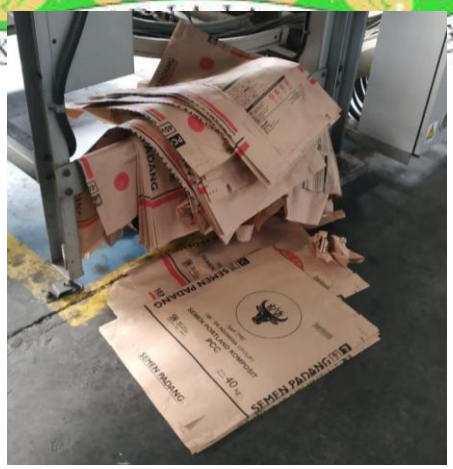

Figure 1.1 Waste of the printing process

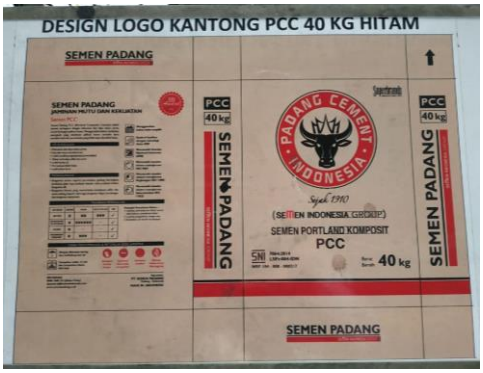

Figure 1.2 Standardized Bag Design

The percentage of reject product is seen in **Table 1.2.** The number in the table shows the percentage of reject product that can't be rework by repair operator. The red font indicates that there are an excess number of reject product based on the predetermined limit of the plant.

Table 1.2 The percentage of reject product

Period	% Reject	
	Line III	Line IV
Juni	1,20%	1,20%
Juli	0,73%	1,57%
Agustus	0,86%	0,93%
September	0,95%	0,95%
Oktober	1,15%	0,76%
November	0,64%	1,26%
Desember	0,94%	1,03%
Januari	0,98%	1,21%
Februari	1,04%	2,97%
Maret	1,19%	1,13%
April	0,89%	1,13%
Mei	1,17%	1,17%
Juni	1,12%	4,64%

(source: daily production report of Packing Bag Plant PT. Semen Padang)

Therefore, improvements are needed in packing bag plant of PT. Semen Padang by applying the concept of Lean Manufacturing that consist of waste identification and elimination. Lean manufacturing is one of the most important steps many that major businesses have been attempting to implement to sustain competitiveness in an expanding global market (Zahraee et al. 2014). Successful implementation of lean manufacturing is very important to increase quality and waste reduction.

1.2 Problem Formulation

Based on the background above, the formulated problem in this research are:

1. What type of wastes occurred in packing bag production process in packing bag Plant of PT. Semen Padang?
2. What are the recommendations can be proposed to minimize the wastes in packing bag production process in packing bag Plant of PT. Semen Padang?

1.3 Research Objectives

Based on the problem formulation, the objectives of this research are as follows:

1. To identify wastes in the packing bag production process at Packing Bag Plant of PT Semen Padang.
2. To propose some improvements to minimize the wastes exist in the packing bag production process.

1.4 Research Scopes

The scopes of the problem researched that conducted in Packing Bag Plant PT. Semen Padang is as follows:

1. The object of the research is only for paper bag product (pasted bag).
2. Historical data used in this research start from January 2019 – July 2019

1.5 Outline of Report

This proposal consists of three chapters as follow:

CHAPTER I INTRODUCTION

This chapter contains background, problem formulation, research objectives, research scopes, and outline of the report.

CHAPTER II LITERATURE REVIEW

This chapter contains some explanation about the literature used to make the report. The literature can be in a formed of theories that obtained from any sources, such books, journal, and the previous research.

CHAPTER III RESEARCH METHODOLOGY

This chapter contains the explanation of steps or methods to complete the research. The method must be done systemically started from the preliminary study until the conclusion is done.

CHAPTER IV RESULTS AND DISCUSSIONS

This chapter contains the research results and discussions which include data collecting and data processing. Data is processed with five methods: Value Stream Mapping (VSM), Waste Identification, Value Stream Analysis Tools (VALSAT), Fishbone Diagram, and Failure Mode and Effect Analysis (FMEA).

CHAPTER V CONCLUSIONS

This chapter contains the research conclusions and suggestions for further research.