CHAPTER I INTRODUCTION

I.1 Research Background

Inventory is goods that stored for use or sale in the future or incoming period. Inventories consist of raw materials, semi-finished goods, and finished goods. Inventories cannot be avoided, this is because a supply will facilitate the ongoing production process. The appropriate inventory management is really affecting the service level of the company in serving their customers, where the main objective of inventory management is to have the appropriate amounts of materials in the right place, at the right time, and at low cost (Tersine, 1994).

The smoothness of the production process can be determined by the availability of packaging. Good inventory management and control is necessary to avoid overstock causing various costs that will burden the company, and also stock out that can make the company loss because it cannot meet the needs of consumers. One benefit of the inventory is to provide service to customers as well as possible so that the customer's demand at a certain time can be fulfilled by ensuring the availability of the finished goods.

Inventory problems can be influenced by several parameters such as demand, lead time, holding costs, ordering cost, back order costs and price, which often vary in the real situation. Deterministic models are not sensitive for these changes. To cope their variations, especially variation of lead time and demand, the probabilistic model is characterized by the presence of safety stock that is an important part of the company inventory policies. Safety stock be able to meet the demand during lead time. (Putri, Jonrinaldi, & Noviani, 2015)

Demand for cacao in the world increasingly and supported by the increase of consumption from three countries which are Indonesia, India, and China. According to the Trade Ministry, citing data from Data International Cocoa Organization (ICCO), the cocoa consumption of the three countries is currently still low at 0.25 kilograms (kg) per capita per year. Going forward, the consumption of the three countries will reach 1 kg per capita per year. Thus, from those three countries, there

will be an additional 2.2 million tons of cocoa demand per year. ICCO estimates world demand growth of about 4 million tons per year.

Company XYZ is a company runs in the cocoa industry located in Bandung. Company XYZ has done more than 200 co-creation sessions. So, the company receives an order from the customer, for example by modifying the product that suitable for the needs or according to the customer's want, then the company will be fulfilled their needs. The process of making chocolate in Company XYZ begin from cocoa farming which is the purchase of seed from farmer to cocoa processing which includes seed processing, and the output is a product that contains cocoa liquor, cocoa cake, cocoa butter and cocoa powder.

Company XYZ will send their product to customer, the product sending must use right packaging for each SKU (Stock Keeping Unit), the amount of packaging material inventory will impact on customer satisfaction, calculating the optimum safety stock and determining the right reorder point will result in high customer satisfaction and also can optimize total inventory cost.

The company's safety stock is based on the standard deviation of demand, service level, and service factor of the company. And the determination of overstock is the comparison between ending inventory each month with safety stock for each SKU.

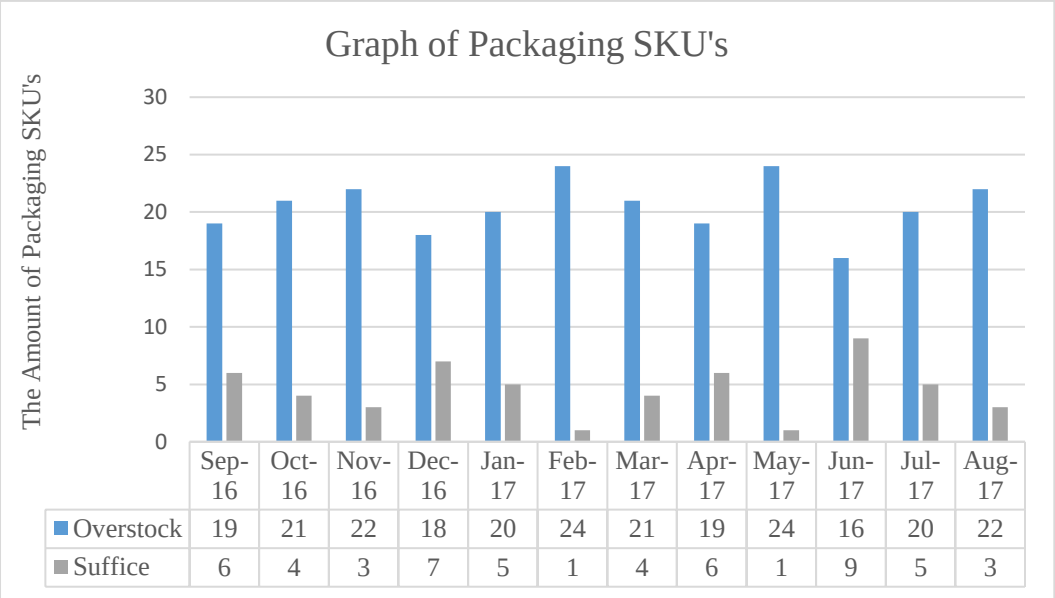

Figure I.1 Graph of Packaging SKUs

From the above diagram is the description data for 25 Packaging SKU that experienced some circumstances, it can be concluded that the number packaging SKUs that experienced overstock is always there every month, it can be seen on the graph. The overstock chart shows the amount of pasckaging SKUs that overstock for each month, this conditions will result in the accumulation of inventory in warehouses which means more cost is embedded in unproductive inventory. This is because the embedded cost in the inventory cannot be used for other necessity that has more profitable purposes.

For stock out condition, in this company for packaging material has never experienced stock out, this is because the company policy that always add more of packaging material that caused condition of stock out will not happen.

The suffice chart shows the packaging SKUs which is still within the safe limit which is not overstock and not stock out. This condition is where the determination of inventory to the related SKU is correct and can be said that the amount of inventory is already in safe limits.

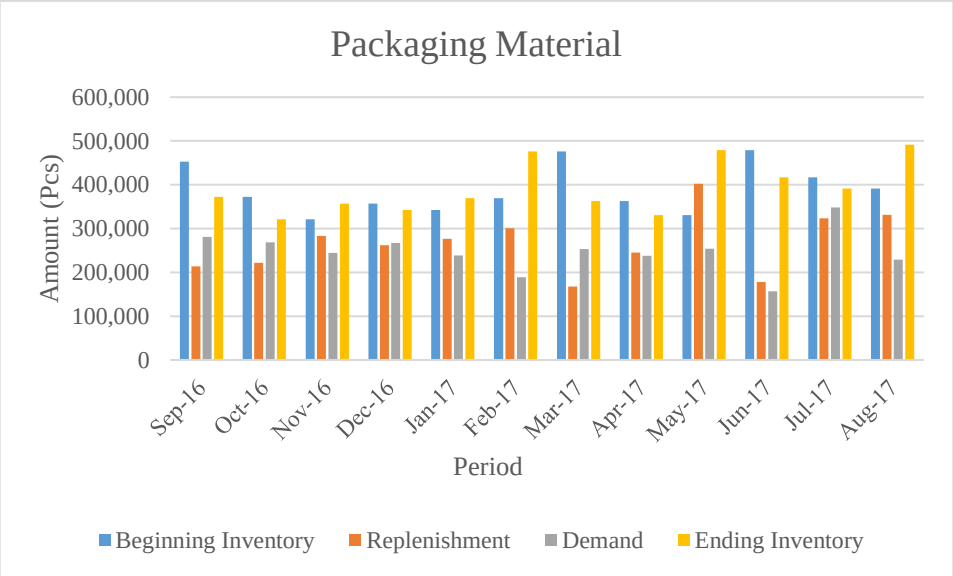

Figure I.2 Graph of Packaging Material Inventory

Since the packaging is a dependent goods to the finished goods, from the graph above the demand listed is a demand based on the sale of finished goods. Demand, beginning inventory, and ending inventory that contained in the graph is the sum of all packaging SKUs in each month. The company ordered a lot of packaging material it can be seen on the replenishment, so this resulted lot of ending inventory and it can lead to high overstock, especially if the packaging SKUs stored has a large dimension and it can consume a lot of space in the packaging material warehouse. For replenishment is refilling actual inventory. And for ending inventory in each month, this is become the beginning inventory for fulfill the demand in the next month.

If seen in the previous graph, there are several case which are overstock and suffice. If the company experienced overstock, this event is due to sales suddenly dropped when Company XYZ has ordered a large amount of packaging material to supplier to facing high demand. This can make the company a loss because some packaging SKU has a fairly expensive price, if overstock occurs on the SKU then the company will cost a lot.

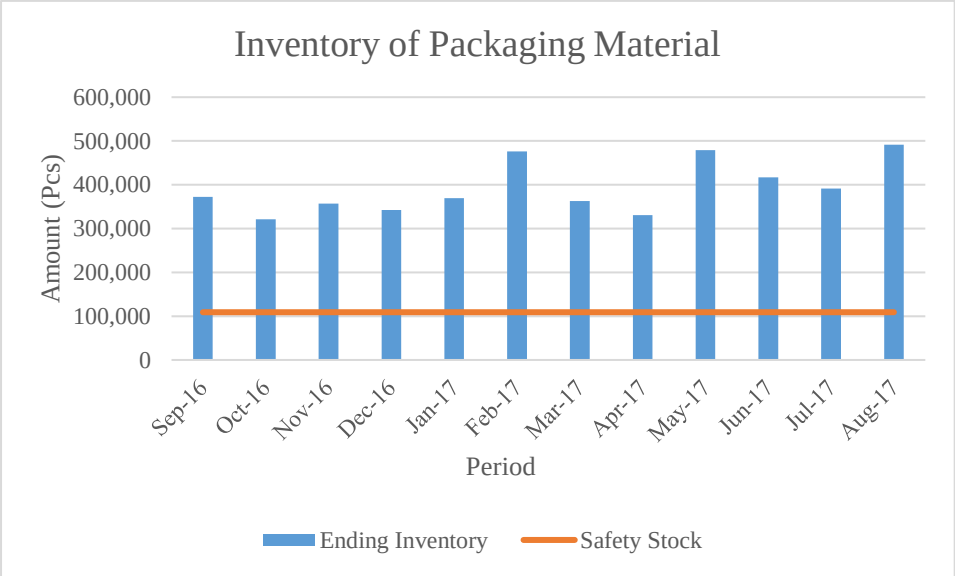

Figure I.3 Sales graph of Company XYZ

Figure I.3 shows ending inventory for one year and its safety stock. When compared between the numbers of safety stock and ending inventory looks very much the amount of excess inventory and this condition causes high inventory cost resulting in the company loss. If seen in Aug-17 the number of overstock for the entire SKU reaches 382,194 pcs. Companies need to improve policies for their inventory packaging material.

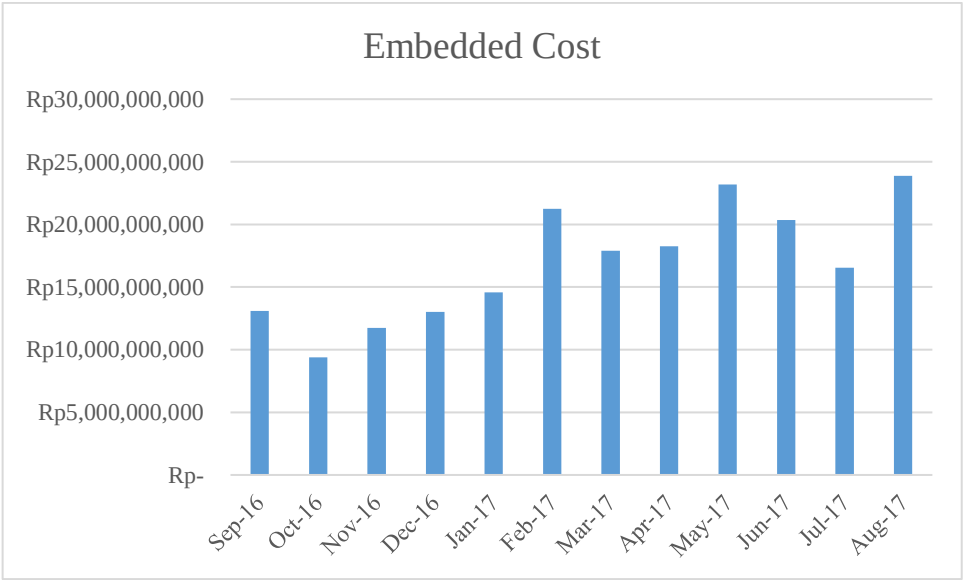

Figure I.4 Graph of Embedded Cost

From the figure above can be seen the number of embedded cost from each month, the amount of embedded cost is very high, in Aug-17 the cost reaching Rp23,882,306,994. The embedded cost is obtained from the gap between Ending Inventory and Safety Stock in Figure I.3 which is multiplied by the price of the packaging material of each SKU.

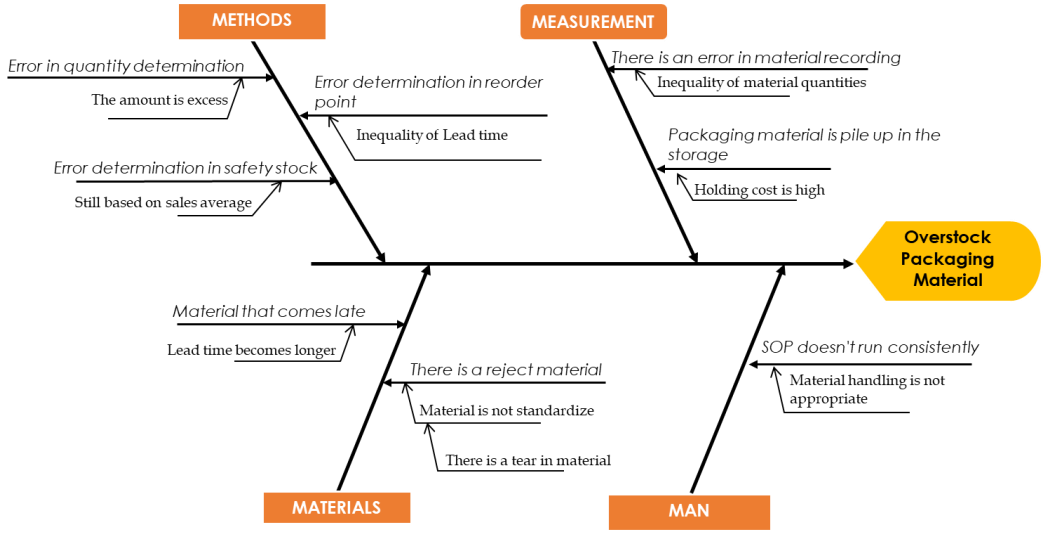

Figure I.5 Fishbone Diagram

Figure above is fishbone diagram based on problems that consist in Company XYZ.

I.2 Problems Identification

Referring to the demand of the packaging material characteristics that have probabilistic distribution, the problem identifications of this research are:

1. How to determine the policy of packaging material for cocoa so it cannot experienced overstock at Company XYZ?
2. How to save inventory cost of packaging material for cocoa that experienced overstock at Company XYZ?

I.3 Research Objective

The objectives of this research are:

1. Determine the policy for packaging material for cocoa to minimize overstock at Company XYZ.

2. Determine the optimal inventory policy by using joint replenishment method to save cost of inventory for packaging material that experienced overstock at Company XYZ.

I.4 Research Limitations

In order to get the research done in focused to the purpose, the limitations of this research are as follows.

1. Demand data from September 2016 to August 2017 at Company XYZ.
2. Data processing does not pay attention to price increases or inflation.
3. Inventory of Packaging Material that calculated is dependent item, which is packaging material depends on finished good demands.
4. Research is not until the implementation phase, only until the proposal phase only.

I.5 Benefits of Research

In this research the output will be obtained is to provide benefits for the parties concerned, and obtained recommendations from the optimal solution for Company XYZ. Obtained recommendations to reduce over stock that can minimize the total cost of inventory.

I.6 Writing system

Chapter I Introduction

This chapter contains the background, it is proposed to make an improvement of warehouse based on their characteristics. Second is problem identification, the most important thing in problem identification is how to describe the problem starting from general problem into the main point that asked on the research. In addition, there are problem identification, research purposes, research limitations, research benefits and writing systematics.

Chapter II Literature Review

In this chapter, there are several theories and methods that supports the research, the objective of this chapter is to forming the mindset and theoretical basis that later will be used on the process of research. This chapter is also discussing the relationship between the concept of studies and research

benefits. So, the problem will be solved by the method that have already researched.

Chapter III Research Methodology

This chapter explains the sequence of research in detailed steps including: Problems Formulation, Data Analysis, Describing the Hypothesis, Designing Process and Analyzing the data, and conduct the conclusion and recommendation for the company.

Chapter IV Collecting and Processing Data

On this chapter, there will be shown the general data of the company and the other supporting data from several sources like Interview, testing, observation and collected data from the company. This data will contribute to solve the problems regarding the relevant topics on the company. Processing data is done in accordance with method which already been stated on research methodology on chapter III.

Chapter V Analysis

On this chapter, there will be analysis on the Processing Data that has been done on the chapter IV. The analysis also done by compare the initial state with the proposed improvement state.

Chapter VI Conclusion and Suggestion

This chapter describes the conclusion and the result of the research, there is also suggestions to the company and next research for future improvement.