Chapter I Introduction

I.1 Research Background

The key to the success of logistics management become one thing that is very important for the industry and the economy from year to year, but it is relatively new recognized to be an important thing and realized the function lately (Rusthon, Croucher, & Baker, 2010). Along with the development of the industry today cause competitive rivalry among manufacturing companies to survive and continue to optimize the performance and processes. The optimization can be done through improvement or performance improvement process, including the production process (production activities), receiving of the material process (receiving activities), delivery process (transportation activities), warehousing process and many more. A good inventory management should reduce the fluctuation of uncertainty of both demand and supply and desired product availability without making higher cost. (Chopra & Meindl, 2010)

PT.XYZ is one of the *Al Quran* printing companies that is quite famous in Indonesia. *PT.XYZ* has subsidiaries spread all over Indonesia. The product that produced by *PT.XYZ* grouped in several categories, there are: Al-Quran, Islamic books and electronic goods.

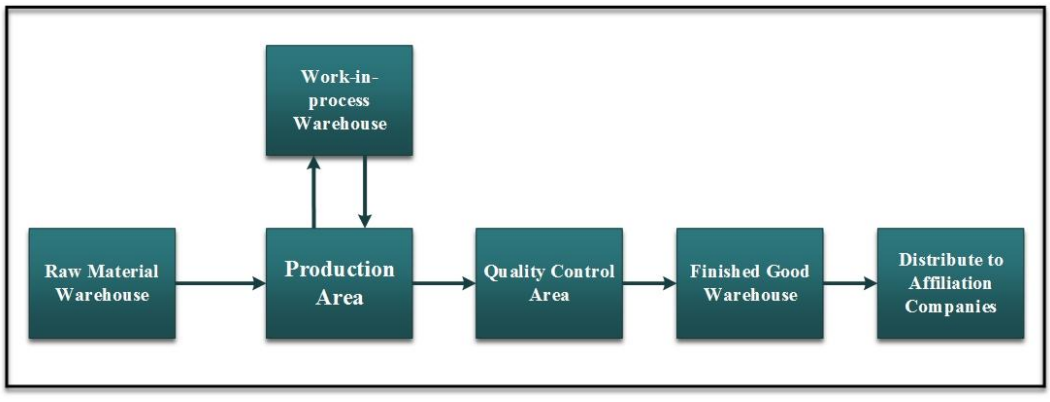

Figure I.1 Overview of Fabrication Process in PT.XYZ

Figure I.1 shows the process of printing Al Quran starts from bringing raw materials that will be needed for the production process. In the production, the products work-in-process will be stored in warehouse work-in-process before being used for next production processes. Typically, the products are called the

products work-in-process if the products cannot be completed within working day or wait for next the products fully processed before heading into of finished goods assembly process. The finished product is stored in the finished goods warehouse before being sent to the subsidiaries. Products are sent when there is a request from subsidiaries. Figure I.2 shows demand for all kind of Al-Qur'an from subsidiaries for 1 year.

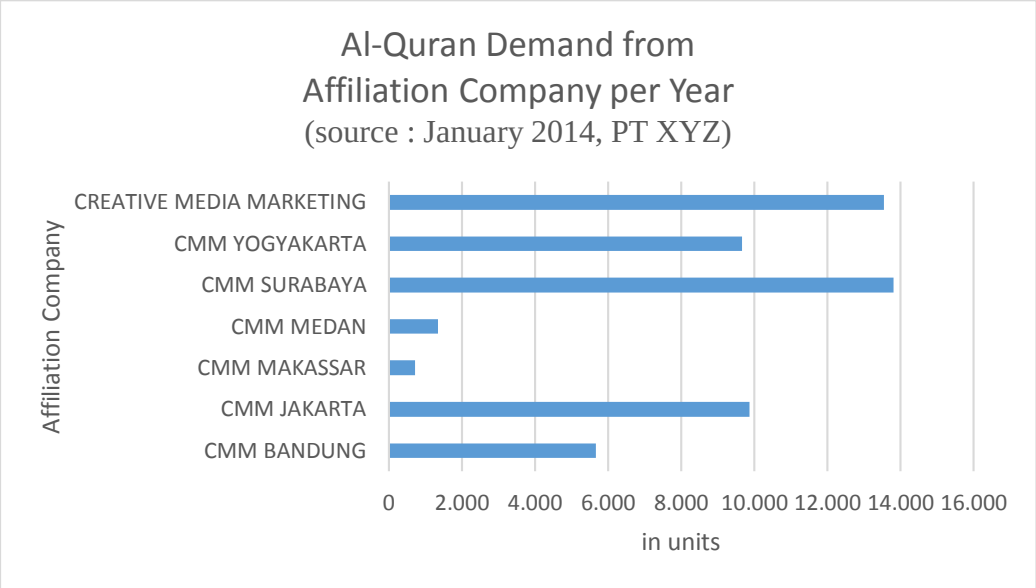

Figure I.2 Demand from Affiliation Company per Year

Inventory management is required in determining the amount of inventory that should be exist in warehouse. Good inventory management will reduce costs contained in the inventory procurement process such as holding cost, ordering cost, cost of obsolescence, deterioration stockout cost. Inventory can absorb about 25-40% of the logistics cost and showed a significant proportion of the total assets of the company (Farahani, Rezapour, & Kardar, 2011).

In addition, good inventory management services will also help optimize the company becomes better by increasing the responsiveness of the optimal inventory control.

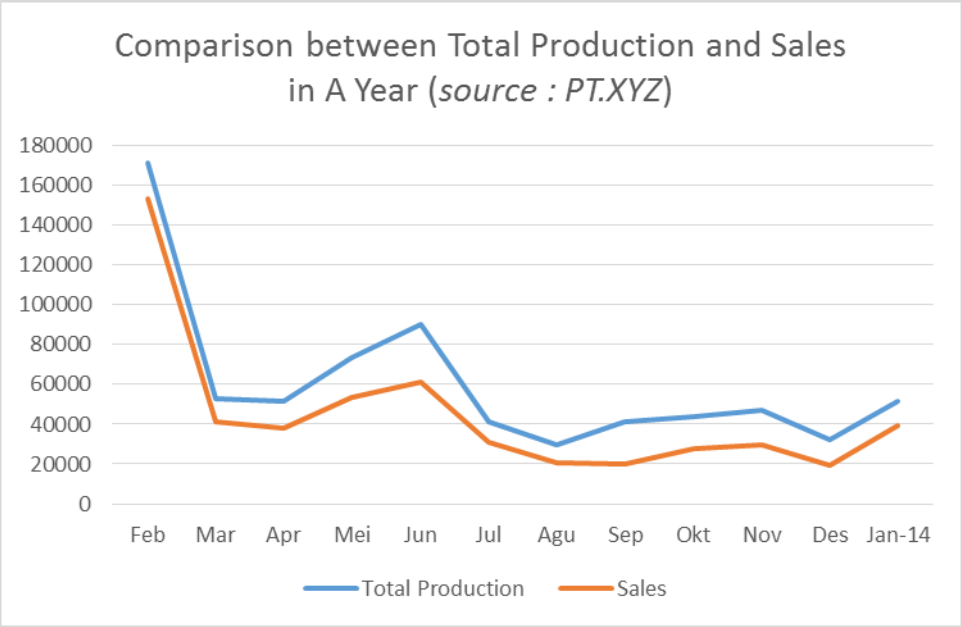

Figure I.3 Comparison between Sales and Number of Product

However production lot size for making or printing all type Al-Qur'an at PT.XYZ Company can be said to be not optimal. This can be evidenced from the comparison of sales and the number of products that produced from February until January 2014. In the figure I.3 shows that the number of products and sales have a significant difference.In other ways, the company doesn't able to produce the total product according to the costumer demand. Thus resulting in increased inventory of finished goods in the warehouse.

According to the interview result that has been conducted from Production manager, the company could produce about 3000 units of Al-Qur'an each day.The condition is suspected caused by the incompatibility of the level of production of goods requested that is not according to the costumer demand. Too many manufactured goods (finished goods) will certainly have an impact on the higher inventory costs. In addition, high inventory will also result in higher warehouse utility.The reason why the company always produce a lot of product are to handle fluctuation of demand and uncertainty of production rate. In the result, in indutrial ways it becomes and considers as a waste of inventory.

In traditional economic production quantity method, the parameter that should be affect to the quantity of production is always assumes as a constant. In the reality,

especially on this case, those are quite ideals. Many disturbance sources that could affect to quantity of product that should produce, for example the fluctuation in demand, delay arrival raw material, and production schedule that is not always according to the planned schedule.

For anticipating that disturbances, fuzzy economic production quantity should solved the problem by making an approriate decision for production lot size in every condition. The same case had been solved by Huey-Ming Lee and Jing-Shing Yao, they solved the problems using fuzzy EPQ and make the approriate production lot size in several disturbances condition, demand and production fuzzy quantity. (Lee & Yao, 1997)

So based on the case, it is necessary to improve inventory policy on finished goods warehouse at PT.XYZ. One of these improvements include the expected maximum amount of inventory in the warehouse, inventory reserves according to production lot size, and minimizing total inventory costs without reducing the level of responsiveness and service levels especially in finished good warehouse PT.XYZ.

I.2 Problems Definition

Based on the background described the formulation of the problem of this study follows is how to minimize total inventory cost for Al-Quran at *PT.XYZ* ?

I.3 Research Objectives

The purpose of the research is to minimize total inventory cost for Al-Quran at *PT.XYZ*

I.4 Research Limitation

In order the research conducted focused on the goal to be achieved, then some of the limitations of the study are:

1. The research is limited to inventory control in finished good warehouse on *PT.XYZ.*
2. During the research conducted, the warehouse will be not expanded or moved
3. Demand data used is the historical data from February 2013 to January 2014.
4. Raw material for all type Al-Qur'an will always exist in RM warehouse
5. Demand can still has fluctuation around the standard value

I.5 Benefits of Research

Here are benefit of this research :

1. Minimize inventory cost
2. Deciding optimal lotsize per production run
3. Propose appropriate inventory policy that can meet the demand of the costumers.
4. Capability to serve as a science and can be used as a reference further discussion and research.

I.6 Writing Systematics

This research is described with systematic writing, as follows:

Chapter I Introduction

This chapter contains a description of the background of research conducted on the finished good warehouse at PT.XYZ, the formulation of the problem, research objectives, benefits of research and systematic writing of the study.

Chapter II Literature Review

In this chapter cointains description of literature and theory that will be used on this reseach. So, the problems that has been mentioned before could be solve using the method that already exist.

Chapter III Research Methodology

This Chapter desribes the detail steps of research including : problems formulation, data analysis, describing the hypothesis, and designing processing and analysing data, and conduct the conclusion and recommendation for the company.

Chapter IV Collecting and Data Processing

In this chapter describes how to collect the data that will be used for data processing stages. The processing stage shall determine the optimal lotsize of the production per run by using fuzzy economic production quantity, reorder point, and calculate the total inventory cost between the existing and the proposal. In this chapter also, the analysis of sensitivity will be conducted. This shall be done for knowing which variable that will be affect the most of the inventory total cost.

Chapter V Analysis

In this chapter, the analysis will be conducted according to which method that will have minimum inventory total cost. Besides, in this chapter also will explain about the result of the calculation by using Fuzzy Economic Production quantity, sensitivity analysis for each variable that influence the inventory total cost.

Chapter VI Conclusion

On this chapter describes the conclusion that has been researched answering to the objectives research. The conclusion will be written according to the result of data processing and analysis stage. Not only that, in this chapter will be describe also the suggestions for the company and for the next research.