CHAPTER 1
INTRODUCTION

1.1. Background

Inventory can be explained as the supply of raw materials, partially finished goods called work-in progress, and the finished products that is maintained by an organization or an enterprise in order to meet its operational needs (Sohail, 2018). Inventory can be treated as an investment for an enterprise, but it also can be treated as a potential source of waste. From this fact alone, we know that inventory should be rigorously controlled. Inventory can also mean as a stock of materials and products that is maintained by an enterprise in order to anticipate the upcoming of some future demand.

The definition of Small and Medium Industry (SMIs) can be explained according to the Regulation of the Minister of Industry of the Republic of Indonesia number 64/M-IND/PER/7/2016 Article 3-4. Small industry is an industry that employs a maximum of 19 workers and has an investment value of less than 1 billion IDR, excluding land and buildings for business premises. While medium industry is an industry that employs a maximum of 19 workers and has an investment value of at least 1 billion IDR or employs at least 20 workers and has an investment value of a maximum of 15 billion IDR.

Frequent changes and new events that occur within the market create another challenge for forecasting. This makes the Small and Medium Industry (SMI) wonder if the proposed production plan that they create will come true 100%. This will later affect the purchase of the inventory they needed for the production stage. SMIs will eventually purchase bigger or smaller amount of materials from their suppliers, and of course it will have an impact to the actual amount needed for their demand. SMIs are in fact putting themselves at risk. Not only the risk for excess stock or stock-outs, but it can also increase their expense for storage (S., K., & R., 2011).

Inventory issues can cause business failures. Imagine a condition where an organization is running out of a critical inventory item, it will affect the production stage. Different techniques of inventory management is a very helpful tool for the business to help determine the optimum level of inventory. It can also be very useful to solve problems related with the safety level of products, materials, and lead time (Sohail, 2018). The market is a very dynamic environment. Therefore, it is very important to focus on making the correct decisions for the future.

This is where machine learning comes into play. The role of Artificial Intelligence here is to team up with the oversight of human and will later be treated as a part of the system. Artificial intelligence (AI) should not be treated as a substitute for the system or even as the system itself. By utilizing a machine learning model together with the supervision of human, this can create a very good tool for inventory management. There are many large enterprises in the world that are using machine learning or AI in their inventory process to optimize their inventory and the results are very impressive. From this, we can conclude that by utilizing artificial intelligence (AI) for inventory management will create a significant impact for inventory management based on demand forecasting (Kumar, Pragathi, Prateek, K., & Madhuri, 2020).

1.2. Research Question

Based on the background of the research that the author explained above, the author formulated the research questions as follows:

1. How to build a system to help manage the inventory related problems faced by Small and Medium Industry (SMI)?
2. How can machine learning help to tackle the previous problem?

1.3. Research Objectives

This research is aiming to develop a machine learning model for inventory management of Small and Medium Industry (IKM) based on demand prediction.

1.4. Significance of Study

For this research, the author expected this research to be an input for:

a. Academics:

This research is expected to be a source of additional knowledge and information for the community. Furthermore, this research is expected to be the basis and guide for further research development, especially in the areas of inventory management and machine learning.

b. Small and Medium Industry(IKM)

This research is expected to be a source of information and knowledge for Small and Medium Industry (IKM) to help them tackle the inventory management problems in their organizations. This research can be useful information for the Small and Medium Industry (IKM) so that they can manage their inventory better and to help with its decision making.

1.5. Writing Systematic

The structure of this thesis will be divided into five chapters. The five chapters that is arranged systematically will explain about:

CHAPTER 1: INTRODUCTION

Chapter 1 contains the background of the study and the problem that the author wants to tackle, and the phenomenon gap. Proceed with the formulation of the research problem. It also contains the objectives of the research.

CHAPTER 2: LITERATURE REVIEW

Chapter 2 will explain about previous literatures that is being used as the reference of this research.

CHAPTER 3: RESEARCH METHODOLOGY

Chapter 3 contains the methods used to create the application.

CHAPTER 4: ANALYSIS AND DISCUSSION

Chapter 4 will analyze the collected data using the methods explained in the previous chapter and explain the results of the research.

CHAPTER 5: CONCLUSION, LIMITATION, AND SUGGESTION

This chapter will conclude the research results, and explain the limitation also the suggestions for future research.