

CHAPTER I

INTRODUCTION

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

1.1 Background

One of the modes of transportation most widely used by the public is motor vehicles. Based on the Law of Indonesia Republic Number 22 Year 2009 Chapter I Article 1 Number 8, motor vehicles are any vehicles that are driven by mechanical equipment in the form of machines other than vehicles that run on the rails. According to Subdirektorat Statistik Transportasi (2017), motor vehicles are divided into four types, including passenger cars, freight cars (trucks), buses, and motorcycles. **Figure 1.1** shows the number of motor vehicles in Indonesia from 2013 – 2017 based on national statistics.

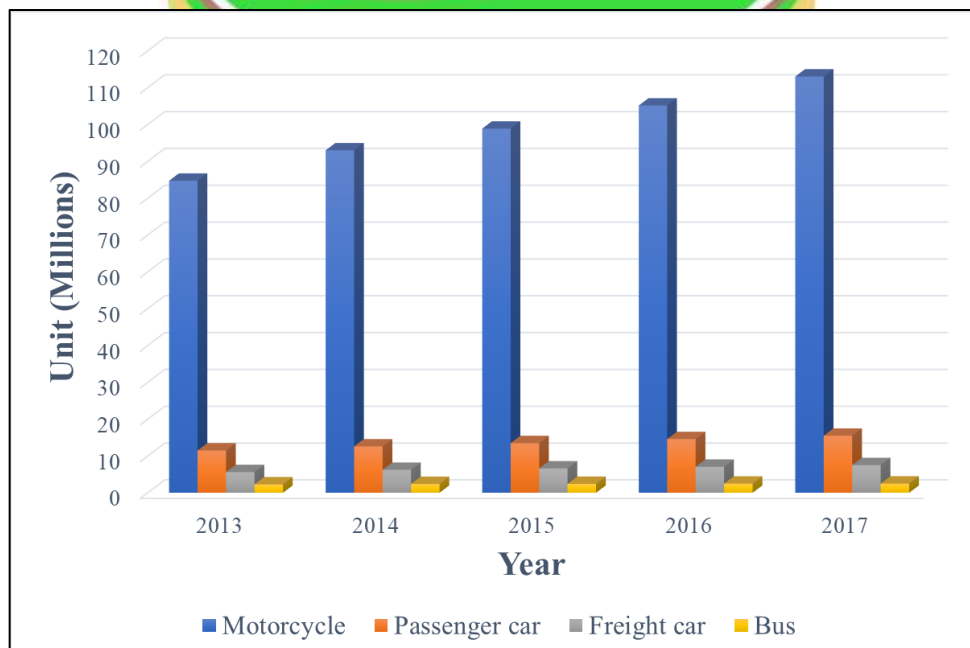


Figure 1.1 Number of Motor Vehicle in Indonesia
(Source: Subdirektorat Statistik Transportasi, 2017)

As the population increases, the demand for motor vehicles is also increasing. The increase in the number of vehicles occurred in all kinds of vehicles every year. It can be seen from **Figure 1.1** during the periods of 2013 – 2017, the number of motor vehicles increases by about 7.4 percent annually (Subdirektorat Statistik Transportasi, 2017).

Of all types of motor vehicles, there is a very significant increase motorcycle. It is because motorcycles have a very high purchasing number in the community and affordable for the community, especially for the middle-to-lower class. Based on the Law of Indonesia Republic Number 22 Year 2009 Chapter I Article 1 Number 20, motorcycle is a two-wheeled motor vehicle with or without houses and with-or-without side trains or three-wheeled motor vehicles without houses. The high price of cars is one of the reasons behind the increase in motorcycles demand, especially for Indonesian people who prefer to ride their own vehicles rather than using public transportation (Pamungkas, 2013).

Jambi is a province of Indonesia. It is located on the east coast of central Sumatra and spans to the Barisan Mountains in the west. The area of Jambi Province is 53.435,72 km² consists of 50.160,05 km² land area and 3.274,95 km² sea area (Pemerintah Provinsi Jambi, 2018). The number of populations of Jambi in 2018 is 3,570,272 (BPS – Jambi, 2019). **Figure 1.2** shows the growth in the number of motorcycles over the past five years in Jambi.

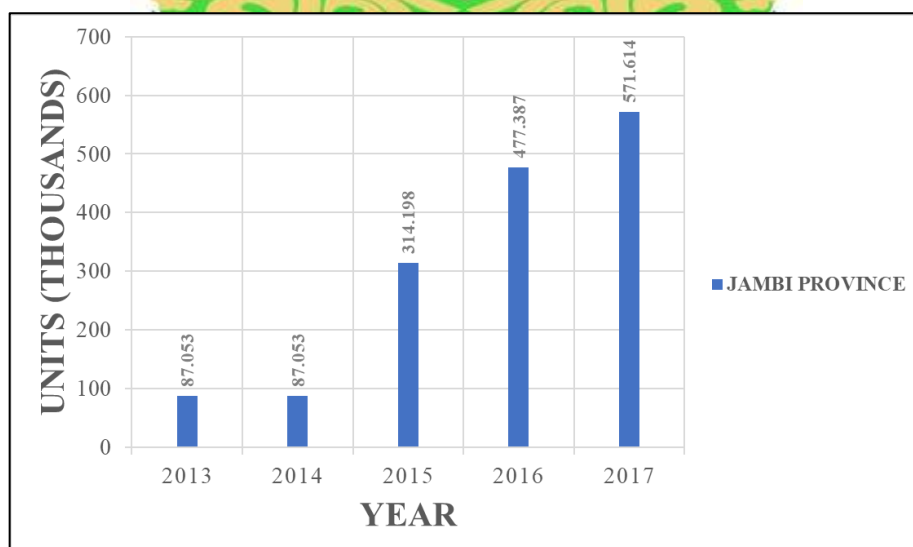


Figure 1.2 Number of Motorcycles in Jambi
(Source: BPS - Statistics Indonesia – Jambi, 2017)

Based on **Figure 1.2**, the highest increase in motorcycle growth occurred between 2014 until 2015. The growth of the population using motorcycles was caused by the growth of people who needed motorcycles. Currently, every household has a motorcycle to be used in daily activities such as work, school, health services, shopping, financing (bank/insurance), and visits to the home of a friend (Herwangi *et al.*, 2015).

With the increasing number of motorcycles, then there is also an increase in the number of motor services that provide repair service and spare parts. The higher the quality of the parts used, the higher the durability of the motorcycle. The need for motorcycle spare parts is crucial because it affects the durability of the motorcycle. Because motorcycle servicing activities have increased, the demand for spare parts also increased. The increase in the need for spare parts leads to an increase in spare parts sales business. The increase in selling spare parts will increase the stores that provide spare parts (ARF, 2019).

The increasing number of motorcycle workshops that offer spare parts increases the competition among them. What makes the difference in every motorcycle shop lies in the service of the workshop. If the service at the workshop is good, you will get consumers and their loyalty. Consumers who are loyal to the workshop will repair their motorcycles and buy the spare parts they need in the same place continuously, and will not move to another place.

One of the motorcycle workshops in Jambi province that provides motorcycle repair services and spare parts distribution is the AHASS AA Motor workshop. AHASS AA Motor is located at Jalan Pahlawan Wirotho Agung, Rimbo Bujang, Tebo, Jambi. Currently, there are two types of business of AHASS AA Motor. First, AHASS AA Motor supplies the spare parts to their workshop's needs and then, as a reseller to sell spare parts directly to another workshop. AHASS AA Motor sells their spare parts in Rimbo Bujang and another region at Jambi and West Sumatra. Spare parts obtained by AHASS AA Motor come from Astra Motor Jambi dealer. Then AHASS AA Motor acts as a dealer for various workshops that have worked together and spread in various regions.

One of the important parts that support operational activities at AHASS AA Motor is the warehouse section. AHASS AA Motor has a warehouse as a central place responsible for purchasing and storing the motorcycle parts. The location of the warehouse is next to the workshop in charge of repairing the motorcycles. As one of the main aspects of the cash flow and revenue for this workshop, AHASS AA Motor must pay great attention to the warehouse management, especially to the spare parts inventory management.

Based on the interview with the head of the workshop warehouse, currently, AHASS AA Motor didn't have a proper approach yet to manage the procurement of spare parts. The recent order quantity is determined based on the average of the last month's demand, and it will be ordered to fulfill the next two until three months of demand for each spare part. The period of making an order is based on the speculation of the supervisor. The supervisor only sees the availability of spare parts in the warehouse, if not available, then an order is made, which is there is no specific calculation to determine it. Because there is no decent policy for managing stock, many types of spare parts are out of stock. AHASS AA Motor fulfills the demand of the spare parts for its self and its consumers. **Table 1.1** shows is an example of data summary of inventory status spare parts in January until December 2018. All of them can be seen in **Appendix A**.

Table 1.1 Summary of Inventory Status Spare Parts in January – December 2018

No	Spare Parts	Periode	1	2	3	4	5	6	7	8	9	10	11	12	Total
1	VALVE EXHAUST (EX)	Beginning Inventory	120	100	85	90	130	110	80	88	85	86	90	105	
		Demand	250	200	100	90	300	200	120	110	100	140	90	205	1905
		Ending Inventory	0	0	0	0	0	0	0	0	0	0	0	0	
		Stockout	130	100	15	0	170	90	40	22	15	54	0	100	736
2	VALVE EXHAUST (IN)	Beginning Inventory	120	100	85	90	130	110	80	88	85	86	90	105	
		Demand	240	185	100	95	285	190	120	110	105	130	95	205	2641
		Ending Inventory	0	0	0	0	0	0	0	0	0	0	0	0	
		Stockout	120	85	15	5	155	80	40	22	20	44	5	100	691
3	SEAT, VALVE SPG	Beginning Inventory	110	100	85	90	120	110	80	88	85	86	90	105	
		Demand	180	150	115	120	250	200	155	165	100	95	110	200	1840
		Ending Inventory	0	0	0	0	0	0	0	0	0	0	0	0	
		Stockout	70	50	30	30	130	90	75	77	15	9	20	95	691

(Source: AHASS AA Motor, 2018)

Table 1.1 Summary of Inventory Status Spare Parts in January – December 2018 (Cont.)

No	Spare Parts	Periode	1	2	3	4	5	6	7	8	9	10	11	12	Total
4	LIFTER ASSY, TENSIONER	Beginning Inventory	13	11	10	10	15	12	11	10	11	11	10	15	
		Demand	32	22	20	25	40	25	33	40	25	24	30	50	366
		Ending Inventory	0	0	0	0	0	0	0	0	0	0	0	0	
		Stockout	19	11	10	15	25	13	22	30	14	13	20	35	227
5	CYLINDER, COMP	Beginning Inventory	10	6	5	8	15	11	5	6	6	5	7	16	
		Demand	30	15	20	20	45	30	15	20	15	18	21	40	289
		Ending Inventory	0	0	0	0	0	0	0	0	0	0	0	0	
		Stockout	20	9	15	12	30	19	10	14	9	13	14	24	189
6	COVER, RADIATOR	Beginning Inventory	6	3	3	4	12	8	4	3	5	3	4	10	
		Demand	15	7	5	8	20	11	7	6	15	5	8	25	132
		Ending Inventory	0	0	0	0	0	0	0	0	0	0	0	0	
		Stockout	9	4	2	4	8	3	3	3	10	2	4	15	67
7	FAN COMP, COILING	Beginning Inventory	6	3	3	4	12	8	4	3	5	3	4	10	
		Demand	15	7	5	8	20	11	7	6	15	5	8	25	132
		Ending Inventory	0	0	0	0	0	0	0	0	0	0	0	0	
		Stockout	9	4	2	4	8	3	3	3	10	2	4	15	67
8	RADIATOR COMP	Beginning Inventory	6	3	3	4	12	8	4	3	5	3	4	10	
		Demand	15	7	5	8	20	11	7	6	15	5	8	25	132
		Ending Inventory	0	0	0	0	0	0	0	0	0	0	0	0	
		Stockout	9	4	2	4	8	3	3	3	10	2	4	15	67
9	JOINT, THREE WAY HOUSE	Beginning Inventory	6	3	3	4	12	8	4	3	5	3	4	10	
		Demand	15	7	5	8	20	11	7	6	15	5	8	25	132
		Ending Inventory	0	0	0	0	0	0	0	0	0	0	0	0	
		Stockout	9	4	2	4	8	3	3	3	10	2	4	15	67
10	SEAL MECHANICAL	Beginning Inventory	30	28	25	25	40	30	28	25	27	26	26	35	
		Demand	55	30	20	15	50	20	25	25	30	35	30	50	385
		Ending Inventory	0	0	5	10	0	10	3	0	0	0	0	0	
		Stockout	25	2	0	0	10	0	0	0	3	9	4	15	68

(Source: AHASS AA Motor, 2018)

Table 1.1 shows that the inventory status for the first ten of all spare parts. In the table above, it can be seen the condition of the stockout^{*)}, which is the maximum potential stockout for each month on each spare part. The conditions of the intended stockout shown in **Table 1.1** are the maximum potential stockout

conditions. The maximum potential stockout condition arises because the AHASS AA Motor does not have a record of the number of orders and when to order. Fluctuating consumer demand causes the need for a strategy or inventory policy that attempts to meet consumer demand. If there is no inventory when there is a demand, it will result in out of stock (*stockout*). This situation can lead to losses due to the loss of opportunities for profit, one of which is the profit from the sale of each unit of goods demanded. (Bahagia, 2014). With the probabilistic stockout cost and demand, it is necessary to apply a probabilistic inventory model. The probabilistic inventory model is almost the same as the deterministic model, and this model is added with safety stock to anticipate and reduce demand fluctuations (Bahagia, 2014).

Inventory problems appear due to the difference between product demand and sales. Therefore, inventory is needed to manage the difference between demand and sales. This difference happens because of stochastic and uncertain conditions. Companies need to implement an appropriate inventory policy system to maintain product availability and avoid embedded funds the product so that it will have a positive impact on the company (Faturhman, 2016). Stockout of spare parts will cause such losses consumers dissatisfaction, reduced brand and/or store loyalty. The most obvious result of stockouts is financial losses (Sanchez-Ruis *et al.*, 2018).

According to the interview with the head of the workshop warehouse, with the intention to solve this issue, the managerial in AHASS AA Motor can't order the spare parts from other workshops because the spare parts from AHASS AA Motor are supplied by one main supplier and AHASS AA Motor is one of the biggest workshops around Rimbo Bujang, even Tebo Regency itself. Also, the absence of a certain inventory policy will have an impact on the financial aspect whereby the price of spare parts increases by 10% from normal prices and the worst conditions are losses of up to hundreds of millions of rupiah. Another thing that is applied by the workshop is to ask consumers to wait for the spare parts coming and then be notified if the parts are available or ask consumers to purchase the spare parts in another workshop because they are out of stock.

Although the workshop has already implemented those solutions, they have a negative impact on their financial and service quality.

Based on the current condition, it can be concluded that AHASS AA Motor doesn't have a proper spare parts inventory management system yet, and it gives many negative impacts for both consumers and workshops. There has been no analysis and evaluation of the spare parts inventory management system because of the negligence of the policymaker and unfamiliarity with inventory management. The inventory management on the workshop warehouse in AHASS AA Motor has a complex situation that is a concern with the quality of service and financial aspect. Therefore, it is needed to develop the inventory policy for motorcycle spare parts in AHASS AA Motor.

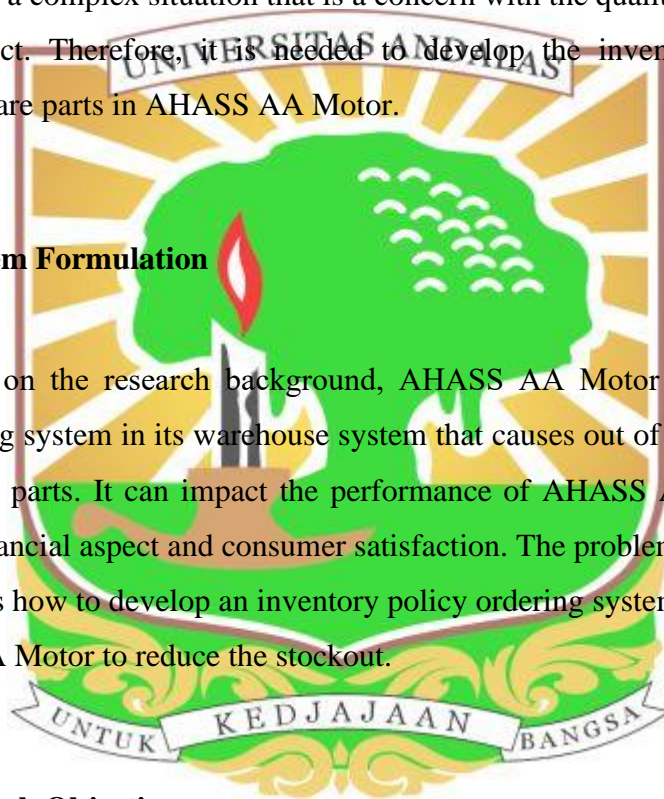
1.2 Problem Formulation

Based on the research background, AHASS AA Motor doesn't have a proper ordering system in its warehouse system that causes out of stock in various types of spare parts. It can impact the performance of AHASS AA Motor itself both in the financial aspect and consumer satisfaction. The problem formulation in this research is how to develop an inventory policy ordering system for spare parts in AHASS AA Motor to reduce the stockout.

1.3 Research Objectives

The objectives of this research are to:

1. Develop an inventory policy for spare parts in AHASS AA Motor to reduce stockout.
2. Develop the program application for implementing the proposed inventory policy.



1.4 Research Scopes

This research is only focused on the spare parts automatic motorcycle (Vario). It is because the spare parts are the highest sales of AHASS AA Motor.

1.5 Outline of Final Project Report

The outline of this final project report consists of five chapters as follows:

CHAPTER I	INTRODUCTION This chapter contains backgrounds, problem formulation, research objectives, research scopes, and outline of the proposal.
CHAPTER II	LITERATURE REVIEW This chapter describes a review of the related literature of the research. The literature review consists of theories and tools to be used in problem solving, such as the definition of inventory, objectives of inventory, types of inventory, inventory costs, inventory management and control, inventory policy, ABC analysis, FSN analysis, EOQ model, safety stock, joint replenishment, overview of AHASS Motor, and previous study on inventory system policy.
CHAPTER III	RESEARCH METHODOLOGY This chapter comprises the methodology used in this research include of preliminary study, literature review, problem formulation, research objectives, method selection, collecting the data, results, discussions, and conclusions.
CHAPTER IV	RESULTS AND DISCUSSIONS This chapter describes the data collection and the analyzing data that consists of classifying the spare parts using ABC analysis, classify the spare parts using FSN analysis, create ABC – FSN analysis matrix, calculate total inventory cost

for the proposed inventory policy using probabilistic inventory model & the joint replenishment model, and compare the total cost of proposed inventory both policies; development program applications; and discussions.

CHAPTER V

CONCLUSIONS

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

