

CHAPTER I

INTRODUCTION

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

1.1 Background

Patchouli (*Pogostemon Cabin*) is one of the plants that produces essential oil. Essential oil is the main ingredient in the perfume industry. In addition, essential oils can also be used as cosmetic ingredient, medicine, flavoring, soft drink, and aromatherapy. The essential oil is needed in the international market because the demand of perfume and cosmetics is very high. Usually, essential oil is produced from the steam distillation of patchouli leaves. Patchouli leaves has the highest content of essential oil compared with other part patchouli. The excess of patchouli compared to other essential oil-producing plants is a high level of fixation that can be used to bind the fragrant with essential oil compounds derived from other plants. This high fixation produces good quality oil and its fragrance is more durable (Nurdjannah *et al.*, 2006). Until now, there is no synthesis compound that can replace the function of patchouli oil (Ramya *et al.*, 2017)

Indonesia exports 60% of the world's essential oil needs every year. In addition, about 90% of patchouli oil in the international market comes from Indonesia (Rahmayanti *et al.*, 2017). Essential oil produced by patchouli contributes more than 50% of the total foreign exchange of essential oil (Nurdjannah *et al.*, 2006). This makes patchouli becomes an important essential oil produced in Indonesia.

Sumatera Barat is one of the highest producers of patchouli oil in Indonesia, beside Nanggroe Aceh Darussalam and North Sumatra. Besides, patchouli plants are also cultivated in the island of Java and Sulawesi. The

average of patchouli oil produced by Indonesia is 21 thousand tons each year. More than one quarter come from Sumatera Barat. The largest patchouli oil producing area in Sumatera Barat is Pasaman Barat (Rahmayanti *et al.*, 2017). Sumatera Barat has potential to be the central of patchouli oil development in Indonesia because patchouli that grows there has good quality. In addition, Sumatera Barat is also the largest supplier of patchouli oil in Indonesia.

Patchouli oil of Sumatera Barat potentially has great opportunity to be developed. The development can be done through supply chain management process of patchouli oil (Afrinando, 2011). The supply chain planning and management are useful for understanding the flow of patchouli oil information from farmers, producers, distributors, to consumers. The concept of supply chain management aims at increasing the value in all parts of the supply chain. The decision-making is not only based on one part of the supply chain, but other parts have the same important role in the development of patchouli oil.

There are four main actors in an agro-industries supply chain. They are farmers, producers, distributors, and consumers. Rahmayanti *et al.*, (2017) explained that the stakeholders involved in the patchouli supply chain are farmers, brokers, collectors, exporters, and importers. Farmers, in addition to planting patchouli also plays a role as a producer that processes patchouli to be patchouli oil. Farmers sell patchouli oil to brokers. There are also farmers who sell directly to collectors. Brokers will sell patchouli oil to collectors, and collectors will sell patchouli oil to exporters. The exporter will send patchouli oil to the consumer oversea.

The patchouli oil supply chain chart can be seen in Figure 1.1 below.

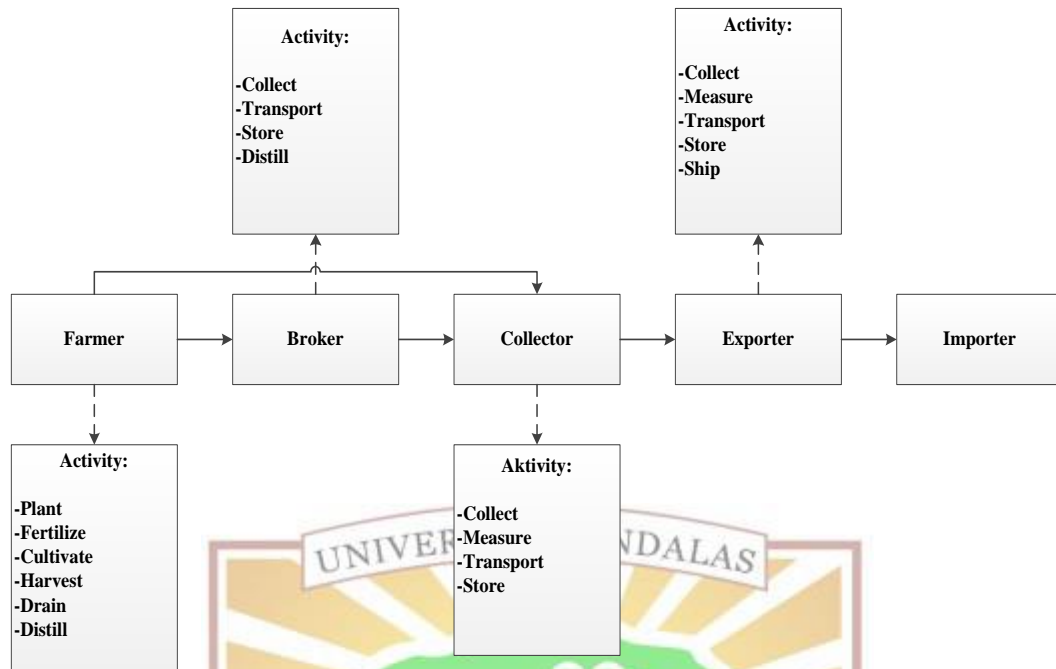


Figure 1.1 Patchouli Oil Supply Chain Chart
(Rahmayanti *et al.*, 2017)

In addition to having opportunities, there are some challenges that become obstacles toward the development of patchouli oil industry, including patchouli oil in Sumatera Barat. The obstacles such as price fluctuation, market information difficulty especially by farmers, poor quality of patchouli oil, traditional technology, pests, global warming, and global crisis (Tekriwal, 2015). These problems occur because of the limited of communication area to facilitate the provision of information among stakeholders so that market information such as price, supply, and demand is still difficult to be obtained. As a result, the most disadvantaged side is farmers due to the lacking information about the market condition causing the weak bargaining position of farmers. Limited information causes limited knowledge about the development of techniques and technology of patchouli processing so that the quality of patchouli oil is poor. This affects the price of patchouli oil sold by farmers. In fact, farmers are the main suppliers and producers of patchouli oil and are instrumental in the development of patchouli oil industry. On the other hand regulators or policymakers are faced with difficulties in making the decision because data and information are complex and not readily available. Existing data is still manual, no data updating, and is not yet online or

available for stakeholder access. The limitation of this information may hamper the development of a sustainable patchouli oil industry (Sutarmin *et al.*, 2017)

Information needed for the development of patchouli oil agro-industry is information based on the supply chain management because this information will be needed by all parties involved in the development of patchouli oil industry. This information requirement can be fulfilled with the supply chain information system of patchouli oil. The availability of integrated information from upstream to downstream will improve the effectiveness and the efficiency, and will be highly beneficial for business information and decision-making by policymakers. Besides, patchouli oil information system can also reduce cost and increase supply effectiveness by farmers, because farmers can produce patchouli oil according to market condition. This also prevents some speculative market players to determine their own market price.

Development function related to patchouli oil industry in Sumatera Barat is in the duties and authority of the Office of Plantation of Sumatera Barat and the Office of Industry and Trade (Perindag) of Sumatera Barat. The duty scopes of Plantation Office are related to the management of the plantation, which is the supply chain activities from suppliers to producers. Meanwhile the duty scopes of Perindag Office are related to products and information flow of supply chain activities from distributors to consumers. Yet all information relates to each other, both Plantation Office and Perindag office require integrated information for all parts of the supply chain to support their policy.

In accordance with the main tasks and function of local agencies, Plantation Office and Perindag Office have the duties to formulate the technical policy, the provision of information, the granting of licenses, and the public services as well as the guidance according to the scope of their duties. In order to support this task, especially in providing information, there is tool needed to provide real-time information about the latest activities in the supply chain that

can also increase cooperation among stakeholders to find out the demand, supply, price, and strategy of developing patchouli oil in the international market.

Currently, there is no tool that can support these functions. The availability of supply chain information of patchouli oil agro-industry is still very limited or still manual, not integrated, and the renewal of data is also less flexible. Therefore supply chain information system of patchouli oil is required, so that policy makers can give and receive information to each other quickly. The information should be in real time because market condition always changes over time.

The information system should be able to provide integrated information in the supply chain of patchouli oil. It should also be able to support the updating data that changes over time so as to provide information in real time. The designed information system is expected to support the tasks of policy makers. This information system is also expected to facilitate stakeholders to access the latest information of patchouli oil industry.

1.2 Problem Formulation

Policy-making requires accurate and up-to-date information. This information is also needed by stakeholders in the supply chain of patchouli oil to support decision making. Information is managed by interested parties and uses appropriate computer-based information technology. This information system must have the ability to maintain accuracy and up-to-date information

Problem statement of this final project is how to design supply chain information system of patchouli oil for the provision and acceptance of information according to the schedule specified and can support data update by policymakers of patchouli oil industry in Sumatera Barat and can be utilized by the stakeholders involved.

1.3 Objective

The objective of this final project is to design an information system of patchouli oil supply chain for the provision of information in real time that can be used by policymakers and stakeholders to support decision making.

1.4 Research Scope

Scopes of this study are explained below:

1. Research is devoted to the provision of information in real time for policymakers and stakeholder needs to support decision making. The information system is excluding transaction process for e-commerce
2. Information systems managed most by the Perindag Office as a provider of information and also the recipient of information. Plantation Office provides the necessary information to Perindag Office and stakeholders and also receives information.
3. Information system can be give advantages to the stakeholders and policymakers. Stakeholders who can take advantage of this information system as a source of information in real time are patchouli farmers, brokers, collectors, and exporters. Policymakers that can get advantages for policy making are Perindag office and Plantation office.

1.5 Outline of Report

The outlines of this final project report are explained below:

CHAPTER INTRODUCTION

Chapter I contains background of the research, problem statement, objective of the research, scope of the research study, and outline of the research report.

CHAPTER II LITERATURE REVIEW

Chapter II contains literature as the reference of the report. The theories are related to the patchouli oil, supply chain management, information system, and database management.

CHAPTER III RESEARCH METHODOLOGY

Chapter III contains systematical step in conducting research, including object, time, data collection, data processing method, and steps of the research.

CHAPTER IV DESIGNING THE INFORMATION SYSTEM

Chapter IV explains the analysis of system requirements, designing the information system using waterfall method, and application of information system.

CHAPTER V THE ANALYSIS OF DESIGNING INFORMATION SYSTEM

Chapter V explains analysis of application designed, analysis of system verification and system validation, analysis of system advantages, analysis of system drawbacks, and analysis of system development direction.

CHAPTER VI Conclusions

Chapter VI contains conclusion of patchouli oil supply chain information system designed and suggestions for the next future research.

