CHAPTER I   PLERIMARY

I.1   Background

The airline industry in Indonesia is experiencing rapid development, where according to International Air Transportation (IATA) predicts that the frequency of flights in Indonesia in 2020 will be included in the top 10 in the world. Based on data from the Directorate General of Civil Aviation (DGCA), There are 12 airlines operating and registered in Indonesia. However, of the 12 airlines, only 8 airlines control and serve strategic routes and the others serve short routes and become beginner or pioneer aircraft for remote areas of Indonesia.
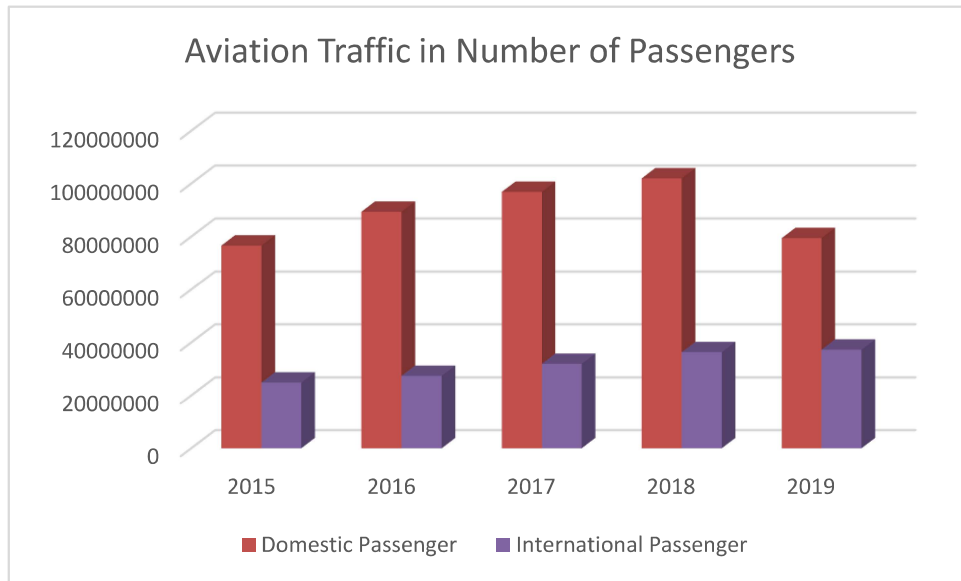

Figure I.1 Graph of Indonesian Domestic and International Aviation Traffic in
Number of Passengers 2015-2019
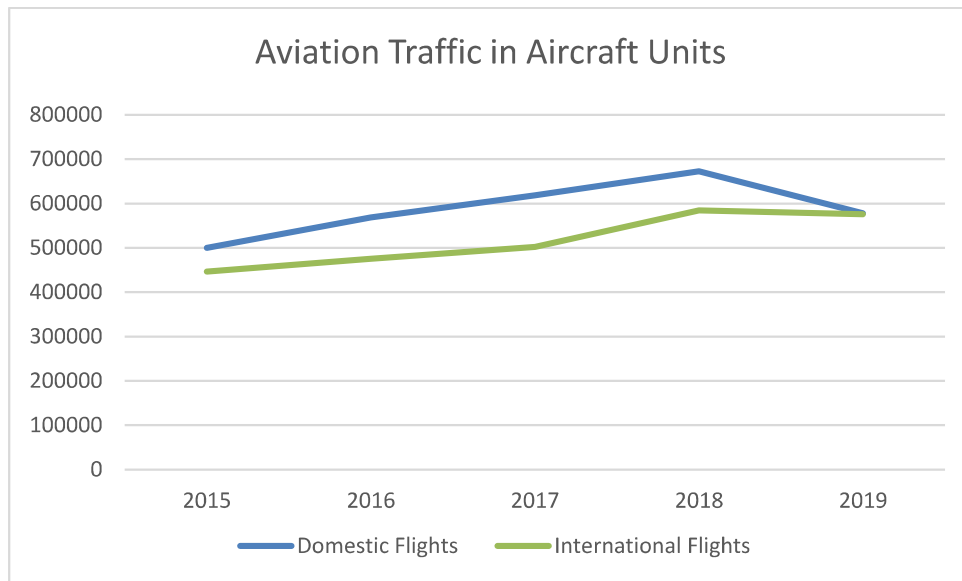Source (Statistik, 2020a)

Figure I. 1 Graph of Indonesian Domestic and International Aviation Traffic in Aircraft Units 2015-2019
Source (Statistik, 2020b)

Based on Figure I.1 and Figure I.2 show a comparison of international flights and domestic flights, where domestic flights have a higher traffic flow. So that there is a growth in aviation in Indonesia, especially in domestic flights. This condition is caused by an increase in business activity and the tourism sector which encourages the growth of domestic flights.

However, in early 2019, many countries decided to close or reduce the frequency of international and domestic flights to suppress the spread of the coronavirus and cause a decline in the aviation industry. With the drastic reduction in the frequency of scheduled flights or scheduled light from March to May 2020 without a clear time, the aviation industry has suffered a lot of losses. This is also felt in Indonesia.

The Ministry of Transportation announced a flight ban for passenger airlines starting from April 24 to June 1, 2020. Where passenger airlines can only be carried out for institutional leaders, guests, and state representatives of international organizations. This decision is also following the Circular of the Task Force for the Acceleration of Handling Covid-19 Number 4 of 2020 concerning Criteria for Restricting People's Travel in the Context of Accelerating Handling of Covid-19.

However, on May 7, 2020, the Minister of Transportation changed the rule,

whereby all modes of transportation may operate again to transport passengers, including airlines, with restrictions and conditions that must be met, such as having a cover letter from the local area, a health letter, or a Covid-19 free certificate, and must implement national health protocols and standards.

The policy of allowing passenger airlines to operate during the covid-19 pandemic has not been able to make the aviation industry able to overcome its losses, so the Ministry of Transportation decided to allow airlines to increase the price of airline tickets during the covid-19 pandemic following the upper limit tariffs that have been set in the Decree. Minister Number 106 of 2019 concerning Tariffs for the Upper Limit of Domestic Economic Service Passengers of Scheduled Commercial Air Transport.
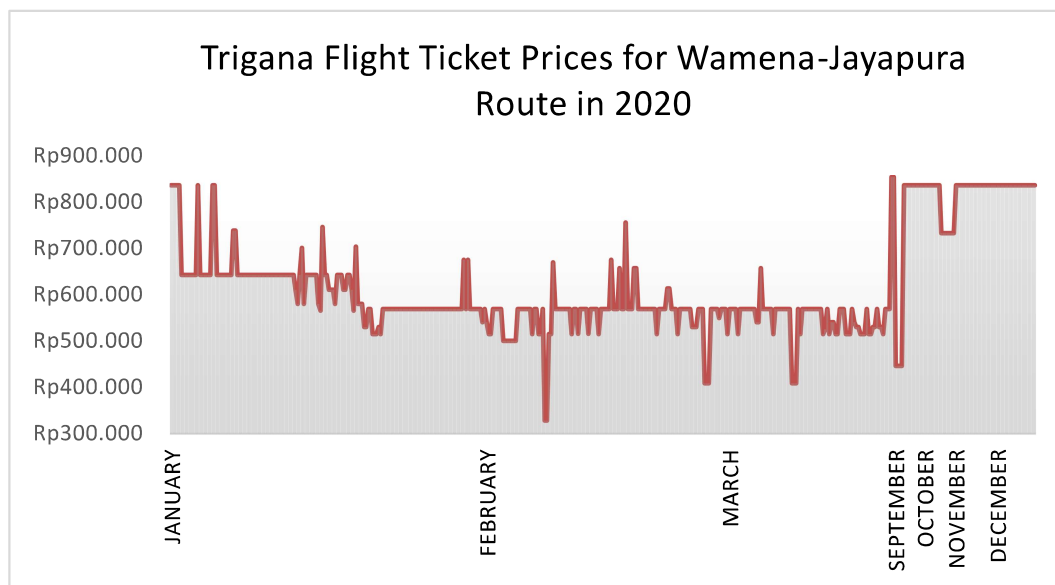

Figure I. 2 Graph of Trigana Flight Ticket Prices in 2020

Source (PT. Yunejer Travel Cakrawala Wisata, 2020)

Figure I. 3 shows Trigana airline ticket prices for Wamena-Jayapura flights in 2020. The data presented is sales data for 7 months, where from April to August there are flight restrictions or airport access closures so for 5 months there is no flight activity. And during the sales there are the lowest price of IDR. 328,500/pax and the highest price is IDR. 835,000/pax. In the conditions of the Covid-19 pandemic, the airline industry has made many changes to airline ticket prices to maintain the company's position in competition in the aviation industry. Every airline has a strategy to survive in the competition between airlines. One of the

strategies implemented by airlines is dynamic pricing of airline tickets or those that are adjusted to the uncertainty of demand.

Dynamic Pricing is a strategy within the Airlines Revenue Manager in the form of pricing arrangements that aim to increase airline revenue. Dynamic Pricing is often applied in the aviation industry because it has characteristics that match the air ticket price which is determined based on certain criteria. These criteria can be in the form of remaining sales time, unsold seats, flight times or schedules, competitor prices, and others. The advantage of implementing a dynamic pricing strategy is that the company or airline can increase or decrease prices according to the company's desire to increase or earn revenue.
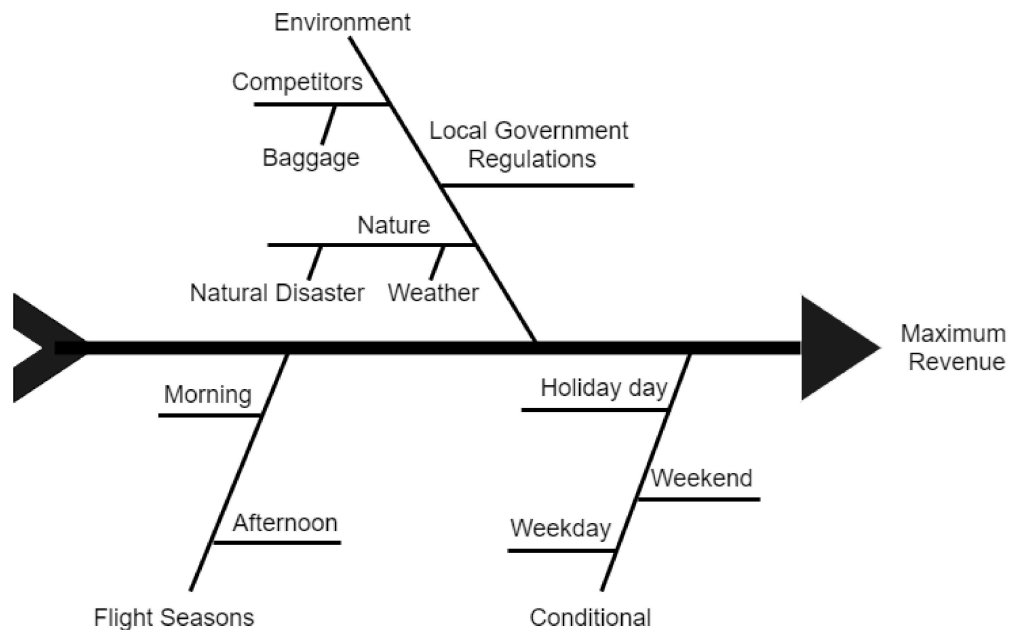

Figure I. 3 Fishbone

Figure I. 4 shows that maximizing airline revenue is influenced by several factors such as conditional factors where on national holidays or weekdays and weekends there are different price variations, then there are flight departure time factors such as flight times in the morning and evening which affect demand, and factors environment such as competitors, nature and regional regulations during the covid-19 pandemic where in order to overcome the spread of covid-19 many regional regulations prohibit flights for a certain period, this results in airlines experiencing losses that affect revenue.

Steps that can be taken to overcome these problems is to make a prediction model of demand and daily flight ticket prices. One method that can be used to

predict prices and demand with continuous numerical values is to use the regression method. Regression aims to find a function that models the data. In creating and processing predictive models, the authors use machine learning tools with the aim of getting results that are more efficient, accurate, and can save time.

Machine learning is one of the technologies that can provide solutions and convenience in designing predictive models, where the application of machine learning techniques can make it easier for companies to deal with price and demand uncertainty in the future by using data from the previous period.

The predictive process in machine learning is understanding the properties or characteristics of unknown objects by identifying patterns in the data set. The hallmark of machine learning is the existence of training, learning, or testing. Therefore, machine learning requires data to be studied as training data, in this case the variables that affect the demand and the price of airline tickets such as requests for airline ticket reservations, departure schedules, holidays, and others. The model that will be generated from the training process will be used as a reference in predicting daily flight ticket prices.

Based on this description, in this final project, a strategy for changing flight ticket prices from airlines for short routes is carried out by processing data using machine learning to maximize revenue. This study was conducted to determine the maximum revenue based on the demand and ticket price prediction model.

I.2   Problem Formulation

Based on the background of the problems that have been stated previously, the research problem formulation of this final project is as follows:

1. How to determine the prediction model for the demand for airline tickets in the next period using the multiple regression method?

2. How to determine flight ticket prices based on demand predictions to get maximum revenue?

I.3   Purpose

The purpose of this final project research is as follows:

1. Determine the predictive model of flight ticket demand for the next period using the multiple regression method.

2. Determine the price of airline tickets at the time of greatest demand to get the maximum profit.

I.4 Limitation

In this final project research, there are research limitations so that the research is not too far from the desired goal. The limitations used in this final project research are as follows:

1. The data used is primary data originating from PT. Trigana Air Service.

2. Air ticket price data used is price data for flights on the Wamena (WMX) – Jayapura (DJJ) route.

3. The observed flight price data are ticket prices for scheduled departures on February 01, 2021 until February 28, 2021.

4. There are 5 independent variables used in making multiple regression models.

5. The airline that is the main object of observation is Trigana Air.

I.5 Benefits

The benefits that can be provided from the research results of this final project are as follows:

1. Provide knowledge about the relationship between variables that affect changes in ticket prices for domestic flights.

2. As a reference for further research on flight ticket price prediction systems.

I.6 Writing Systematic

This final project is described with systematic writing as follows:

Chapter I   Preliminary

This chapter contains a description of the research background, problem formulation, research objectives, research limitations, research benefits, and the writing systematics of the final project research.

Chapter II   Literature Review

This chapter contains literature that is relevant to the problems studied and the results of previous studies are also discussed. The

theoretical basis used is the airline business model consisting of a low-cost carrier and the linear regression and cross-validation methods which are used as tools in managing the data from this research.

Chapter III   Problem Solving Methodology

This chapter describes the research steps in detail including formulating research problems, formulating hypotheses, and developing research models, identifying and operationalizing research variables, designing, collecting and processing data, conducting instrument tests, and designing data processing analysis.

Chapter IV   Integrated System Design

This chapter describes the steps taken in collecting and processing data using a multiple regression model based on the data on flight ticket prices.

Chapter V   Analysis and Evaluation Result

This chapter explains the analyzes and evaluation the interpretation of the results of the data processing model in the previous chapter.

At the evaluation stage of the prediction model, a 10-cross validation test is carried out or 10 times the stages in the development of the multiple regression model that have been made and Numerical testing was also carried out in the form of hypothesis testing.

Chapter VI   Conclusion and Suggestions

This chapter describes the conclusions of the research conducted and the answers to the research questions presented in the introduction. Research suggestions are put forward in this chapter for further research