## IMPLEMENTATION OF FEASIBILITY STUDY PROCESS IN A TRANSPORTATION COMPANY

By

Livianputra Johanes Caesar 11507026

BACHELOR'S DEGREE in

# INDUSTRIAL ENGINEERING ENGINEERING AND INFORMATION TECHNOLOGY



SWISS GERMAN UNIVERSITY
The Prominence Tower
Jalan Jalur Sutera Barat No. 15, Alam Sutera

Tangerang, Banten 15143 - Indonesia

Revision after the Thesis Defense on July  $10^{\text{th}}$  2019

Dean

#### STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis. Livianputra Johanes Caesar Student Date Approved by: Ir. Setijo Awbowo, M.M. Thesis Advisor Date Ir. Triarti Saraswati, M.Eng Thesis Co-Advisor Date Dr. Dipl.-Ing. (FH) Maulahikmah Galinium, S.Kom,. M.Sc

Date

#### **ABSTRACT**

## IMPLEMETATION OF FEASIBLITY STUDY PROCESS IN A TRANSPORTATION COMPANY

By

Livianputra Johanes Caesar Ir. Setijo Awibowo MM, Advisor Ir. Triarti Saraswati M.Eng, Co-Advisor

#### **SWISS GERMAN UNIVERSITY**

Strategies and improvements are very essential in such a competitive time. Established in 2003, PT XYZ has been providing national aviation services among many other airline companies. Projects after projects are developed by PT XYZ in order to keep growing and stay exist in the competition of aviation business. Feasibility study is required by the Division of Corporate Strategy of PT XYZ to assess the risks of their upcoming projects focusing on the financial aspect. PT. XYZ needs a guideline to conduct feasibility study for their upcoming projects. Three upcoming projects are used as experiments to develop the proper guideline to conduct feasibility study. Each project needs different approaches to support the feasibility study process, such as linear programming and Analytical Hierarchy Process. As a result, an initial guideline to conduct feasibility study has been developed, focusing on economical aspect of the project. Further research is recommended to expand the scope of the feasibility study such as technical, legal, and scheduling.

Keywords: Feasibility Study, Return of Investment, Risk, Analytical Hierarchy Process, Linear Programming.



### **DEDICATION**

I dedicate this thesis to my beloved grandma, parents and myself.



#### **ACKNOWLEDGEMENTS**

First of all, I wish to thank God for giving me the strength and patience throughout the process of writing this thesis. Mr. Ir. Setijo Awibowo MM my advisor, for always believing in my potential, and very informative during every advisory session. Mrs. Endang Wahyudarti VP of PT. XYZ for giving me the permission to have a wonderful internship in the company. My supervisor Mr. Hendy, and all of the staff of PT. XYZ who were always kind to me and very responsive, cooperative, and informative during the case works. My parents and siblings for being very supportive and helpful along the journey.

Although it has not been all sweets in the journey, I have found that this thesis project was very enjoyable, and meaningful. I cherished every moment during the internship at PT. XYZ and the thesis work.

# SWISS GERMAN UNIVERSITY

## TABLE OF CONTENTS

|   |   | Page |
|---|---|------|
|   | STATEMENT BY THE AUTHOR                   | 2    |
|   | ABSTRACT                                  | 3    |
|   | DEDICATION                                | 5    |
|   | ACKNOWLEDGEMENTS                          | 6    |
|   | TABLE OF CONTENTS                         | 7    |
|   | LIST OF FIGURES                           | 10   |
|   | LIST OF TABLES                            | 12   |
|   | CHAPTER 1 - INTRODUCTION                  | 15   |
|   | 1.1. Research Background                  | 15   |
|   | 1.2. Research Problems                    | 15   |
|   | 1.3. Research Objective                   | 16   |
|   | 1.4. Significance of Study                | 16   |
| M | 1.5. Scope of Study                       |      |
|   | 1.6. Thesis Structure                     | 17   |
|   | CHAPTER 2 - LITERATURE REVIEW             | 18   |
|   | 2.1. Feasibility Study                    | 18   |
|   | 2.2. Break Even Analysis                  | 19   |
|   | 2.2.1 The Calculation of Break-Even Point | 19   |
|   | 2.3. Return of Investment                 | 20   |
|   | 2.4. Operation Research                   | 20   |
|   | 2.4.1 Linear Programming                  |      |
|   | 2.5. Analytical Hierarchy Process         |      |
|   | 2.5.1 Hierarchy of AHP                    | 21   |

4.6.4.2

| 2.5.2 The Steps of Analytical Hierarchy Process             | 22 |
|---|----|
| 2.5.3 Pairwise Comparison in AHP                            | 23 |
| CHAPTER 3 - RESEARCH METHODS                                | 26 |
| 3.1 Time Frame of Study                                     | 26 |
| 3.2 Research Framework                                      | 27 |
| CHAPTER 4 - RESULTS AND DISCUSSIONS                         | 29 |
| 4.1. Company Profile  | 29 |
| 4.2. Business Operation                                     | 29 |
| 4.3. Problem Identification                                 | 30 |
| 4.4. Business Opportunity                                   | 30 |
| 4.5. Project "Freighter" Feasibility Study                  | 31 |
| 4.5.1 Project Definition                                    |    |
| 4.5.2 Data Acquisition And Preliminary Analysis             |    |
| 4.5.2.1 Fuel Cost   |    |
| 4.5.2.2 Other Operating Cost                                |    |
| 4.5.3 Break-Even Analysis and Return of Investment Analysis | 41 |
| 4.5.3.1 Break Even Analysis                                 |    |
| 4.5.3.2 Return of Investment Analysis                       |    |
| 4.5.4 Result and Recommendation                             |    |
| 4.5.4.1 Feasibility Study Result and Recommendation         | 52 |
| 4.5.4.2 Feasibility Study Process                           |    |
| 4.6. Project "Economy-Premium" Feasibility Study            | 53 |
| 4.6.1 Project Definition                                    | 53 |
| 4.6.2 Preliminary Analysis                                  | 54 |
| 4.6.2.1 Seats   | 54 |
| 4.6.2.2 Operating Cost                                      | 54 |
| 4.6.3 Operation Research                                    | 58 |
| 4.6.4 Break-Even Analysis and Return of Investment Analysis | 61 |
| 4.6.4.1 Break-Even Analysis                                 | 61 |

Return of Investment Analysis......64

| 4.6.5     | Results and Recommendation                            | 66  |
|-----------|---|-----|
| 4.6.5     | 5.1 Feasibility Study Result and Recommendation       | 66  |
| 4.6.5     | 5.2 Feasibility Study Process                         | 66  |
| 4.7. Proj | ject "Aircraft Turnover" Feasibility Study            | 67  |
| 4.7.1     | Project Definition                                    | 67  |
| 4.7.2     | Preliminary Analysis                                  | 68  |
| 4.7.3     | Analytical Hierarchy Process                          | 70  |
| 4.7.4     | Break-Even Analysis and Return of Investment Analysis | 92  |
| 4.7.4     | 4.1 Break-Even Analysis                               | 92  |
| 4.7.4     | 4.2 Return of Investment Analysis                     | 93  |
| 4.7.5     | Results and Recommendation                            | 96  |
| 4.7.5     | 5.1 Feasibility Study Results and Recommendation      | 96  |
| 4.7.5     | 5.2 Feasibility Study Process                         | 96  |
| CHAPTER 5 | 5 - CONCLUSIONS AND RECCOMENDATIONS                   | 97  |
| 5.1. Con  | nclusions   | 97  |
| 5.2. Reco | ommendations  | 97  |
| GLOSSARY  | 7   | 99  |
| REFERENC  | ES  | 100 |
| APPENDICE | ES  | 101 |
| CURRICUL  | UM VITAE  | 122 |