

TABLE OF CONTENTS

ABSTRACT	iii
VALIDITY SHEET	v
ORIGINALITY STATEMENT SHEET	vi
PREFACE	vii
Table of Contents	viii
List of Figures	xi
List of Tables	xiii
List of TERMS	xiv
LIST OF ABBREVIATIONs	xvi
List of APPENDIXES	xvii
CHAPTER I INTRODUCTION	1
I.1 Background	1
I.2 Formulation of the Problem	6
I.3 Goal of the Final Project	6
I.4 Benefits of the Final Project	6
I.5 Outline of Chapters	7
CHAPTER II THEORITICAL BASIS	9
II.1 Literature	9
II.1.1 Data Mining	9
II.1.2 Classification	9
II.1.3 Google Colab	11
II.1.4 Entity Relationship Diagram (ERD)	12
II.1.5 Dashboard	12
II.1.6 Unified Modeling Language	12
II.1.7 User Interface	13

II.2	Selection of Theory/Model/Design Framework.....	14
II.2.1	Reasons for Method Selection	14
II.2.2	Previous Research	16
CHAPTER III	DESIGN METHODOLOGY	19
III.1	Problem Solving Systematic Design.....	19
III.1.1	Preliminary Step.....	21
III.1.2	Data Collecting Step	22
III.1.3	Integrated System Design Phase	23
III.1.4	Testing Step.....	24
III.1.5	Analysis Step.....	25
III.1.6	Closing Step	25
III.2	Identification of Integrated System.....	26
III.3	Limitations	26
CHAPTER IV	INTEGRATED SYSTEM DESIGNING	27
IV.1	Data Collection.....	27
IV.2	Naive Bayes Data Preprocessing Using Google Colab.....	29
IV.2.1	Import Libraries	29
IV.2.2	Import Data	31
IV.2.3	Data Categorization.....	32
IV.2.4	Determining Naïve Bayes Classification Results	35
IV.3	Naive Bayes Accuracy Comparison.....	37
IV.3.1	3 Months Boundary.....	37
IV.3.2	6 Months Boundary.....	38
IV.3.3	12 Months Boundary.....	40
IV.3.4	Boundary Selection Analysis	41
IV.4	Design Process	41

IV.4.1	System Design.....	41
IV.4.2	Entity Relationship Diagram (ERD)	42
IV.4.3	UML Design.....	43
IV.4.4	Verification Design Result	53
CHAPTER V VALIDATION AND EVALUATION OF DESIGN OUTCOMES		54
V.1	Validation of Design Results.....	54
V.2	Analysis of Integrated Systems.....	58
V.3	Analysis of System Strengths and Weaknesses.....	59
CHAPTER VI CONCLUSION AND SUGGESTION		61
VI.1	Conclusion	61
VI.2	Suggestion.....	61
REFERENCES.....		63
APPENDIX.....		66
APPENDIX A - INTERVIEW PROTOCOL AND ANSWER		67
APPENDIX B – VALIDATION QUESTIONNAIRE AND RESULTS.....		70