

TABLE OF CONTENTS

ABSTRACT	I
APPROVAL SHEET	II
STATEMENT OF ORIGINALITY	III
PREFACE	IV
TABLE OF CONTENTS	V
LIST OF TABLES	IX
LIST OF FIGURES	X
GLOSSARY OF TERMS	XII
LIST OF APPENDIX	XIV
CHAPTER I INTRODUCTION	1
I.1 Background	1
I.2 Problem Statement	4
I.3 Research Objectives	5
I.4 Research Benefits.....	5
I.5 Final Project Scope and Assumptions.....	5
I.6 Final Project Report Schematics	7
CHAPTER II LITERATURE REVIEW	10
II.1 Front-End Technologies.....	10
II.1.1 Overview of Front-End Technologies.....	10
II.1.2 Flutter Framework.....	10
II.2 Backend Technologies	11
II.2.1 Overview of Backend Technologies	11
II.2.2 Recommendation Systems	12
II.2.3 Speech Recognition.....	14

II.2.4	Whisper by OpenAI	15
II.2.5	Generative AI and ChatGPT	16
II.2.6	Data Processing and Integration.....	17
II.2.6.1	Python Overview.....	19
II.2.6.2	Flask Framework.....	20
II.3	Usability Testing	21
II.3.1	System Usability Scale (SUS).....	22
II.3.2	Single Ease Question.....	24
II.3.3	User Acceptance Evaluation	25
II.4	Software Development Method	26
II.5	State of the Art	30
CHAPTER III METHODS		35
III.1	Research Method.....	35
III.1.1	Initial Requirements	35
III.1.2	Design	35
III.1.3	Prototyping.....	35
III.1.4	User Evaluation.....	36
III.1.5	Review and Update	36
III.1.6	Development	36
III.1.7	Testing.....	37
III.1.8	Deployment.....	37
III.2	Problem Solving Schematics	37
CHAPTER IV PROBLEM RESOLUTION		41
IV.1	Initial Requirements	41
IV.1.1	User Requirements	41
IV.1.2	System Requirements.....	43

IV.1.2.1	Functional Requirements Analysis	44
IV.1.2.2	Non-Functional Requirements Analysis	44
IV.2	Design	45
IV.2.1	Use Case Diagram.....	45
IV.2.2	Use-Case Scenario	47
IV.2.2.1	Use Case Scenario of Submit Complaint.....	47
IV.2.2.2	Use Case Scenario of Ask Follow-Up Question	48
IV.2.2.3	Use Case Scenario of Save Chat History	48
IV.2.2.4	Use Case Scenario of Access Saved Chats	49
IV.2.2.5	Use Case Scenario of Access App Tutorial Functionality	49
IV.2.2.6	Use Case Scenario of Delete Saved Chats	50
IV.2.3	Activity Diagram.....	50
IV.2.3.1	Activity Diagram of Submit Complaint.....	51
IV.2.3.2	Activity Diagram of Ask Follow-Up Question.....	52
IV.2.3.3	Activity Diagram of Save Chat History	53
IV.2.3.4	Activity Diagram of Access Saved Chats	54
IV.2.3.5	Activity Diagram of Access App Tutorial Functionality	55
IV.2.3.6	Activity Diagram of Delete Saved Chats	56
IV.2.4	Sequence Diagram	56
IV.2.4.1	Sequence Diagram of Submit Complaint.....	57
IV.2.4.2	Sequence Diagram of Ask Follow-Up Question.....	58
IV.2.4.3	Sequence Diagram of Save Chat History	58
IV.2.4.4	Sequence Diagram of Access Saved Chats	59
IV.2.4.5	Sequence Diagram of Access App Tutorial Functionality....	60
IV.2.4.6	Sequence Diagram of Delete Saved Chats.....	61
IV.2.5	Class Diagram	62

IV.2.6	Entity Relationship Diagram.....	64
IV.3	Prototyping.....	65
IV.3.1	Designing the Application User Interface.....	65
IV.3.2	Creating the Application Back-End Code.....	67
CHAPTER V RESULTS, VALIDATION, AND IMPLICATION.....		73
V.1	User Evaluation.....	73
V.1.1	REST API Black box Testing	73
V.1.1.1	Functional Testing.....	74
V.1.1.2	Non-Functional Testing (Load Testing)	78
V.1.2	SEQ and SUS Testing	82
V.2	Review & Update.....	85
V.3	Development	87
V.4	Testing.....	89
V.5	Deployment	92
V.6	Interpretation and Implication.....	93
CHAPTER VI CONCLUSION AND SUGGESTIONS.....		95
VI.1	Conclusions.....	95
VI.2	Suggestions	96
REFERENCES.....		98
Revision Notes Table		111