



**ARTIFICIAL INTELLIGENCE CHATBOT**  
**APPLICATION FOR OPTIMIZING LEGAL SERVICE**

**UNDERGRADUATE THESIS**

**Submitted as one of the requirements to obtain  
Sarjana Komputer**

**By:**

**Reza Febran Pahlevi  
001202000176**

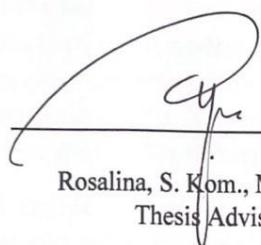
**FACULTY OF COMPUTING  
INFORMATICS STUDY PROGRAM  
CIKARANG  
May 2023**

**WEB-BASED FOR PORTAL ALUMNI INFORMATION**

By

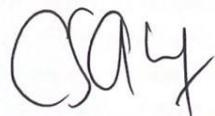
ROPANDI RITONGA  
001202000077

Approved:



---

Rosalina, S. Kom., M. Kom.  
Thesis Advisor



---

Cutifa Safitri, Ph.D.  
Program Head of Informatics Study  
Program



---

Ir. Rila Mandala, M.Eng., Ph.D.  
Dean of Faculty of Computing

## STATEMENT OF ORIGINALITY

In my capacity as an active student of President University and as the author of the  
thesis/final project/business plan (underline that applies) stated below:

Name : Reza Febran Pahlevi

Student ID number : 001202000176

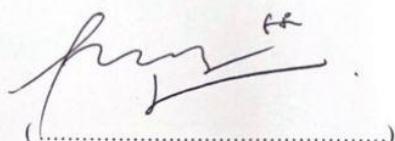
Study Program : Informatics

Faculty : Computer Science

I hereby declare that my thesis/final project/business plan entitled "**Artificial Intelligence Chatbot Application for Optimizing Indonesia Legal Service**" is to the best of my knowledge and belief, an original piece of work based on sound academic principles. If there is any plagiarism detected in this thesis/final project/business plan, I am willing to be personally responsible for the consequences of these acts of plagiarism, and will accept the sanctions against these acts in accordance with the rules and policies of President University.

I also declare that this work, either in whole or in part, has not been submitted to another university to obtain a degree.

Cikarang, 3 April 2023



(.....)

Reza Febran Pahlevi

**SCIENTIFIC PUBLICATION APPROVAL FOR ACADEMIC INTEREST**

As an academic community member of the President's University, I, the undersigned:

Name : Reza Febran Pahlevi

Student ID number : 001202000176

Study program : Informatics

for the purpose of development of science and technology, certify, and approve to give President University a non-exclusive royalty-free right upon my final report with the title

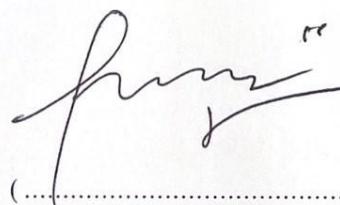
:

**ARTIFICIAL INTELLEGENCE CHATBOT APPLICATION FOR  
OPTIMIZING LEGAL SERVICE**

With this non-exclusive royalty-free right, President University is entitled to converse, to convert, to manage in a database, to maintain, and to publish my final report. There are to be done with the obligation from President University to mention my name as the copyright owner of my final report.

This statement I made in truth.

Cikarang, 3 April 2023



(.....)

Reza Febran Pahlevi

## **ADVISOR APPROVAL FOR JOURNAL/INSTITUTION'S REPOSITORY**

As an academic community member of the President's University, I, the undersigned:

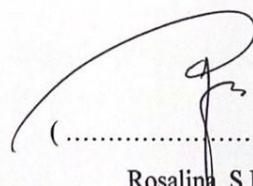
Name : Rosalina, S.Kom., M.Kom.  
ID number : 0426068404  
Study program : Informatics  
Faculty : Computer Science

declare that following thesis :

Title of thesis : Artificial Intelligence Chatbot Application for Optimizing Indonesia Legal Service  
Thesis author : Reza Febran Pahlevi  
Student ID number : 001202000176

will be published in journal / institution's repository / proceeding / unpublish /

Cikarang, 3 April 2023



( ..... )  
Rosalina, S.Kom., M.Kom

## SIMILARITY INDEX REPORT

### ARTIFICIAL INTELLIGENCE CHATBOT

#### ORIGINALITY REPORT

<b>11</b> %	<b>11</b> %	<b>1</b> %	<b>0</b> %
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

#### PRIMARY SOURCES

1	repository.president.ac.id Internet Source	6%
2	dspace.daffodilvarsity.edu.bd:8080 Internet Source	1%
3	ejs.co Internet Source	<1%
4	m.mu.edu.sa Internet Source	<1%
5	etd.astu.edu.et Internet Source	<1%
6	www.idsemergencymanagement.com Internet Source	<1%
7	ir.msu.ac.zw:8080 Internet Source	<1%
8	Taylor N Stephens, Angela Joerin, Michiel Rauws, Lloyd N Werk. "Feasibility of pediatric obesity and prediabetes treatment support through Tess, the AI behavioral coaching	<1%

## **ABSTRACT**

In the field of law, especially legacy, there are many pasal and laws that are listed. And if someone is related to the law and needs certain pasal then someone must find and validate it accurately with their needs combines a technological advance and the world of law and legacy that is integrated with chatbots and ai and can create an interface with its users and lighten the burden for those who need it. Due to the author's concern about this issue, the author developed a system to help the who need for finding some pasal and legacy using web based and AI bot.

For this project the author decided to make a web based project can filter pasal with integrated Artificial Intelligence then applied to the chatbot to make it easier for someone to qualify pasal and laws that are needed by users who are looking for pasal or legislated in need. With several features on the Web, the author provides the sorting of pasal needed - Chatbot for looking for the required article components and then calibrating it with technology "speech" the user can search for a component just by speaking then the chatbot will catch what the user means.

## **ACKNOWLEDGMENTS**

First and foremost, I would like to thank the almighty god Allah swt for giving me the chance to accomplish my final project under the title “**Artificial Intelligence Chatbot Application for Optimizing Indonesia Legal Service**”

It took me a handful of long and grueling months for me to make this final project so that I could earn my degree in Bachelor of Science in President University. Therefore, I would like to express my greatest gratitude to the following :

1. My beloved parents and younger brother, for your support, encouragement, and love;
2. Mrs. Rosalina, S.Kom, M.Kom, as my final project mentor and advisor for giving me invaluable advice and support in creating my final project;
3. Mr. Williem, Mrs. Cutifa, Mrs. Rosalina, Mr. Andika Candra J ,and all Information Technology Major lecturers who have given me knowledge and experience about life after university
4. Bu Indah and Mam Lina who always be helpful related university information and internship
5. All 2020 Information Technology Classmates, 2022 SOPU Friends, and computing friends for various unforgettable experiences during campus life.
6. And to all parties who have supported me, which was unmentioned by me. I hope this research can be useful for all readers

## TABLE OF CONTENTS

	Page
STATEMENT OF ORIGINALITY .....	iii
DEDICATION.....	viii
ACKNOWLEDGMENTS .....	ix
TABLE OF CONTENTS .....	x
LIST OF TABLES.....	xiii
LIST OF FIGURES .....	xiv
CHAPTER I INTRODUCTION.....	1
1.1.    Background .....	1
1.2.    Problem Statement .....	2
1.3.    Final Project Objectives .....	2
1.4.    Scope and Limination .....	3
1.4.1.    Scope .....	3
1.4.2.    Limitation .....	3
1.5.    Final Project Methology.....	3
1.6.    Final Project Outline .....	5
CHAPTER II LITERATURE STUDY .....	7
2.1.    linear search javascript.....	7
2.2.    Chatbot for legacy service.....	8
2.3.    Type Of getting data techniques.....	8
2.3.1.    HTML parsing.....	8
2.3.2.    Css Selector .....	9
2.3.3.    BASE_URL.....	9
2.3.4.    Node js.....	9
2.3.5.    The database .....	10
2.3.6.    Open AI api .....	10
2.3.7.    Speech To Text.....	10
2.4.    EJS ( Embedded JavaScript Templating ).....	10
2.5.    Express js .....	11
2.6.    Cylic Sh.....	13
2.6.1.    Tess Chatbot .....	15
2.6.2.    Lawyer GPT .....	16
2.7.    Comparison Table .....	16
CHAPTER III SYSTEM ANALYSIS .....	18

## TABLE OF CONTENTS

3.1.	System Overview .....	18
3.2.	Functional Analysis	18
3.3.	Hardware and Software Requirements.....	19
3.4.	Use-Case Diagram .....	20
3.5.	Use-case Narrative .....	21
3.6.	Swimlane Diagram.....	28
3.6.1.	Registration Swimlane Diagram .....	28
3.6.2.	Login Swimlane Diagram .....	29
3.6.3.	Dashboard Swimlane Diagram.....	30
3.6.4.	Chat with chatbot Swimlane Diagram .....	31
3.6.5.	Kitab perdata Swimlane Diagram .....	32
3.6.6.	Faq page Swimlane Diagram .....	33
	CHAPTER IV System Design .....	35
4.1.	User Interface Design.....	35
4.1.1.	Login Page.....	35
4.1.2.	Sign Up.....	37
4.1.3.	Dashboard page .....	38
4.1.4.	Chatbot info Page .....	39
4.1.5.	Kitab info page .....	41
4.1.6.	Faq info page .....	42
4.2.	Physical Design .....	44
4.2.1.	Software .....	44
4.3.	Class Diagram .....	45
4.3.1.	Table DB Helper Class.....	45
4.3.2.	Table Chatbot class .....	46
4.3.3.	Table Voice Chat fragment Class .....	46
4.3.4.	Table Daily logactivity class .....	47
	CHAPTER V SYSTEM IMPLEMENTATION .....	48
5.1.	User Interface Development .....	48
5.1.1.	Login Page.....	48
5.1.2.	Sign Up Page .....	49
5.1.3.	Dashboard Page .....	49
5.1.4.	Chatbot Page .....	50
5.1.5.	Kitab Page .....	51
5.1.6.	Faq Page .....	53
5.2.	Application Detail .....	53
5.2.1.	Login And Sign up page.....	54
5.2.2.	Dashboard page .....	57
5.2.3.	Chatbot page (Front end) .....	58
5.2.4.	Chatbot API ( Backend ) .....	59
5.2.5.	Speech Recognition.....	60

## **TABLE OF CONTENTS**

5.2.6. Kitab Code.....	61
5.2.7. Logout Button .....	63
CHAPTER VI SYSTEM TESTING .....	64
6.1. Testing Environment.....	64
6.2. Testing Scenario.....	64
6.2.1. User Interaction .....	65
6.2.2. AI For Chatbot Interaction And Speech Recognition Works.....	68
6.2.3. Open AI Info Working Result .....	71
CHAPTER VII CONCLUSIONS AND FUTURE WORK .....	73
7.1. Conclusion .....	73
7.2. Future Work .....	73
REFERENCES .....	75

## LIST OF TABLES

TABLE	Page
Table 2. 1 Comparison of Related Works.....	17
Table 3. 1 Function Description .....	18
Table 3. 2 Software Requirement .....	19
Table 3. 3 Hardware Requirement.....	20
Table 3. 4 Use-case Narrative of Usecase “Registration” .....	21
Table 3. 5 Use-case Narrative of usecase “login”.....	22
Table 3. 6 Use-case Narrative of Usecase “Chat with chatbot” .....	23
Table 3. 7 Use-case Narrative of Usecase “Dashboard” .....	24
Table 3. 8 Use-case Narrative of usecase “Kitab Perdata” .....	25
Table 3. 9 Use-case Narrative of usecase “FAQ”.....	27
Table 4. 1 User Interface Description – Login Page.....	36
Table 4. 2 User Interface Description – SignUp Page .....	37
Table 4. 3 User Interface Description - Pause Page .....	39
Table 4. 4 User Interface Description - Chatbot Page .....	40
Table 4. 5 User Interface Description Kitab Page .....	41
Table 4. 6 User Interface Description - Summary Page .....	43
Table 4. 7 Software Requirement in the Project Development.....	44
Table 6. 1 Test scenario User Interaction with Website .....	65
Table 6. 2 Test scenario Chatbot with Speech Recognition .....	69
Table 6. 3 Test Scenario Mental Health Info Scraping.....	71

## LIST OF FIGURES

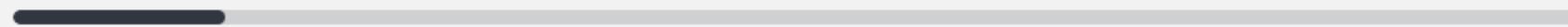
FIGURE	Page
Figure 1. 1 Scheme Of Methodology Waterfall Model [3] .....	4
Figure 2. 1 Linear Alghortihm works.....	7
Figure 2. 2 Express JS .....	11
Figure 2. 3 Cylic .....	13
Figure 2. 4 how the cylic works as a server.....	14
Figure 2. 5 Test chatbot .....	15
Figure 2. 6 Lawyer GPT .....	16
Figure 3. 1 Use-Case Diagram .....	20
Figure 3. 2 Registration Swimlane Diagram .....	29
Figure 3. 3 Login Swimlane Diagram .....	30
Figure 3. 4 Dashboard Swimlane diagram .....	31
Figure 3. 5 Chatbot Swimlane Diagram .....	32
Figure 3. 6 Kitab page Swimlane Diagram .....	33
Figure 3. 7 FAQ page Swimlane Diagram .....	34
Figure 4. 1 User Interface Components - Login Page .....	36
Figure 4. 2 User Interface Components - SignUp Page .....	37
Figure 4. 3 User Interface Components - Dashboard Page .....	38
Figure 4. 4 User Interface Components – Chatbot Page .....	40
Figure 4. 5 User Interface Components – Kitab Page .....	41
Figure 4. 6 User Interface Components – Kitab Page .....	43
Figure 4. 7 Class Diagram .....	45
Figure 4. 8 Table DBHelper class diagram .....	46
Figure 4. 9 Table Chatbot class diagram .....	46
Figure 4. 10 Table Voice Fragment class diagram.....	47
Figure 4. 11 Table DailylogActivity class diagram.....	47
Figure 5. 1 Login page user interface .....	48
Figure 5. 2 Sign Up user interface .....	49
Figure 5. 3 Dashboard Page User Interface.....	50

Figure 5. 4 Chatbot Page User Interface .....	51
Figure 5. 5 Kitab Page User Interface .....	52
Figure 5. 6 Faq Page User Interface .....	53
Figure 5. 7 Login Source code.....	54
Figure 5. 8 Signup page.....	55
Figure 5. 9 backend code.....	56
Figure 5. 10 Connection to database .....	56
Figure 5. 11 Database table .....	57
Figure 5. 12 Dashbord page.....	58
Figure 5. 13 UI chatbot Source Code .....	59
Figure 5. 14 Library For Chatbot .....	60
Figure 5. 15 Speech Recognition.....	61
Figure 5. 16 Array For Search some pasal .....	62
Figure 5. 17 Express For function Logout.....	63
Figure 6. 1. Dashboard .....	66
Figure 6. 2 Signup page.....	66
Figure 6. 3 Chatbot page .....	67
Figure 6. 4 Kitab Page .....	67
Figure 6. 5 Faq page .....	68
Figure 6. 6 Login Page .....	68
Figure 6. 7 Chatbot Luna For Legacy Service.....	70
Figure 6. 8 Permission for allow the microphone .....	71

How did we do?  

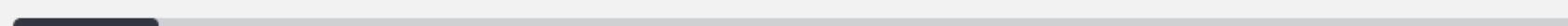
## Stats

Average Perplexity Score: 135.500



A document's perplexity is a measurement of the randomness of the text

Burstiness Score: 92.757



A document's burstiness is a measurement of the variation in perplexity

Your sentence with the highest perplexity, "Cikarang, .....", has a perplexity of: 257

## PANEL OF EXAMINER APPROVAL

The Panel of Examiners declare that the undergraduate thesis entitled **ARTIFICIAL INTELLIGENCE CHATBOT APPLICATION FOR OPTIMAZING LEGAL SERVICE** that was submitted by STUDENT majoring in **Informatics** from the Faculty of Computer Science was assessed and approved to have passed the Oral Examination on 26 05 2023.

### Panel of Examiner



Rosalina, S.Kom., M.Kom



Genta Sahuri, M.Sc



Dr. Hasanul Fahmi, M.Kom