

A FRAMEWORK FOR THE ADOPTION OF LEGAL LLM AI IN THE
INDONESIAN CRIMINAL JUSTICE SYSTEM (CORRUPTION) BASED ON
TOGAF: TRANSFORMING LEGAL WORKFLOW EFFICIENTLY

By

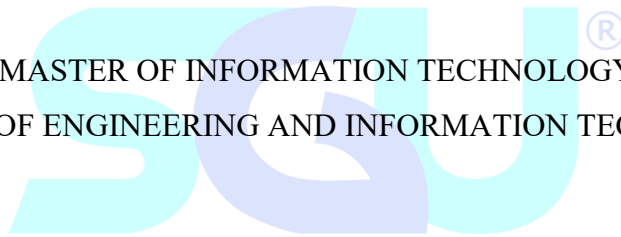
Fontian Munzil

22351044

MASTER'S DEGREE

in

MASTER OF INFORMATION TECHNOLOGY
FACULTY OF ENGINEERING AND INFORMATION TECHNOLOGY



SWISS GERMAN UNIVERSITY

The Prominence Tower

Jalan Jalur Sutera Barat No. 15, Alam Sutera

Tangerang, Banten 15143 - Indonesia

Revision After Thesis Defense on February 4, 2025

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.

Fontian Munzil

Student

8 February 2025

Approved by:



Dr. Ir. Heru Purnomo Ipung M.Eng

Thesis Advisor

Dr. Ir. Moh. A. Amin Soetomo, M.Sc

Thesis Co-Advisor

Dr. Maulahikmah Galinium, S.Kom., M.Sc.

Dean

Fontian Munzil

ABSTRACT

A FRAMEWORK FOR THE ADOPTION OF LEGAL LLM AI IN THE INDONESIAN CRIMINAL JUSTICE SYSTEM (CORRUPTION) BASED ON TOGAF: TRANSFORMING LEGAL WORKFLOW EFFICIENTLY

by

Fontian Munzil

Dr. Ir. Heru Purnomo Ipung M.Eng, Advisor

Dr. Ir. Moh. A. Amin Soetomo, M.Sc, Co-Advisor

SWISS GERMAN UNIVERSITY

This study creates an architecture for incorporating Large Language Model (LLM) Artificial Intelligence into Indonesia's criminal justice system for corruption cases, employing The Open Group Architecture Framework (TOGAF) to improve legal workflow efficiency. The study applies qualitative research methodologies, analyzing over 35,000 Supreme Court corruption case verdicts, prescriptive analysis and conducting Focus Group Discussions (FGDs) with legal and IT specialists. The framework is validated using proof-of-concept testing on Claude 3.5 Sonnet. The findings show that a TOGAF-based framework successfully addresses technological difficulties and ethical issues using a layered infrastructure approach, whereas the Retrieval Augmented Generation (RAG) architecture processes legal documents and improves workflow efficiency. The research developed a solution architecture for integrating LLM AI with current court systems via SPLP (Sistem Penghubung Layanan Pemerintah) interface points.

The study concludes that the recommendation for a structure may considerably enhance Indonesia's legal workflow efficiency in corruption cases by integrating AI in a systematic integration keeping security and ethical requirements. The study suggests creating thorough testing frameworks, applying in place rigorous validation processes, and creating mentorship programs to encourage legal professionals to utilize technology.

Keywords : Architecture, AI, TOGAF, Legal, Corruption

Fontian Munzil



© Copyright 2025
by Fontian Munzil
All rights reserved

DEDICATION

This dedication goes directly to my beloved family and the improvement of
Indonesia's criminal justice system through technology advancement and
transformation



ACKNOWLEDGEMENTS

Assalamu A'laikum Warahmatullahi Wabarakatu

First of all, I would like to express my gratitude to the presence of Allah Subhanahu wa Ta'ala, as only through Allah grace, I have been given the opportunity to create and complete this Thesis on time.

This thesis was prepared as a requirement for obtaining the degree of Master of Computer, Business Informatics, in the Master of Information Technology Program, Faculty of Engineering and Information Technology, Swiss German University. This thesis was written with the hope of increasing knowledge for both readers and the Author with the title "A Framework For The Adoption of Legal LLM AI in The Indonesian Criminal Justice System (Corruption) Based on TOGAF: Transforming Legal Workflow Efficiently"

This thesis could be completed thanks to the guidance, moral support, assistance, and direction from various parties. Therefore, on this occasion, I would like to express my gratitude and highest appreciation to the honourable:

1. Dr. Ir. Heru Purnomo Ipung M.Eng as advisor
2. Dr. Ir. Moh. A. Amin Soetomo, M.Sc, as co-advisor
3. Dr. Eka Budiarto ST, MSc, as examiner

I also expresses my deepest gratitude to the honourable:

1. Dr. Dipl. Ing. Samuel P. Kusumocahyo, Rector
2. Dr. Maulahikmah Galinium, S.Kom., M.Sc., Dean of Faculty of Engineering and Information Technology
3. Dr. Eka Budiarto ST, MSc, Head of Master of Information Technology

My sincere thanks go to my beloved wife **Verra Hanudyana, SE** and children **Tifara Verdy Virelza SE, M.Sc, dr Arfozha Radya Gruveno** dan **Zefoga Fodya Verzharo, BA,BBA** who have provided love, moral support, and understanding for the

reduced holiday time together as I completed this thesis, and my sincere apologies if during the thesis completion period/study period there were any unpleasant matters.

Furthermore, I also extend my gratitude to my beloved mother **Dra. Hj. Suarni** dan father **Ir. H. Munzil Zen, BscApp, BA**, who have given endless attention and love until now so that I could complete this Thesis, and only Allah Subhanahu wa Ta'ala can provide appropriate rewards to both of them.

Furthermore, I also extend my gratitude to my father-in-law Air Vice Marshal TNI AU (Ret) H. Sudjatio Adi and mother-in-law Hj. Sri Rukmini who provided moral support and encouragement to complete this Thesis.

I also express many thanks to the parties who participated in supporting me in completing this Thesis, consecutively to:

1. Siti Ayu Diana Lestari, S.Pd as Faculty Administration Officer for Master of Information Technology,
2. All MIT fellow students, the Business Informatics class of 2022 and all parties whom I cannot mention one by one who have provided motivation and moral support for me in completing the studies.
3. The leaders and library staff of the Faculty of Engineering And Information Technology have provided literature assistance for me to complete this Thesis.
4. All parties whom I cannot mention one by one

Finally, I humbly acknowledge that this Thesis still has shortcomings and needs improvement, I greatly hope that this Thesis can provide benefits for the development of AI Applications in national legal practice. May I continue to gain knowledge and wisdom until death comes to us. Aamiin

Wassalamu A'laikum Warahmatullahi Wabarakatu

Jakarta 15 Januari 2025



Fontian Munzil
Student ID : 22351044

Fontian Munzil

TABLE OF CONTENT

STATEMENT BY THE AUTHOR.....	2
ABSTRACT.....	3
DEDICATION.....	5
ACKNOWLEDGEMENTS.....	6
TABLE OF CONTENT.....	8
LIST OF FIGURES.....	11
LIST OF GRAPHICS.....	14
CHAPTER 1- INTRODUCTION.....	1
1.1. Background.....	1
1.2. Research Problems.....	6
1.3. Research Objectives.....	8
1.4. Research questions.....	8
1.5. Hypotheses.....	9
1.6. Significance of Study.....	9
1.7. Scope.....	9
1.8. Thesis Structure.....	10
CHAPTER 2 - LITERATURE REVIEW.....	11
2.1. Digital Transformation.....	11
2.2. The Landscape of Corruption Cases in Indonesia.....	12
2.2.1. Predicted General Architecture Vision of Criminal Justice System Process.....	13
2.2.2. National Corruption Case Data.....	15
2.2.3. Specific Challenges in Corruption Case Proceedings.....	17
2.2.4. Current Workflow and Pain Points in Legal Processes.....	17
2.2.5. Data Standardization.....	17
2.3. Artificial Intelligence and Large Language Models in Legal Context.....	18
2.4. Technical Aspects of LLM AI Implementation in Legal Systems.....	20
2.5. TOGAF Architecture Development Method (ADM).....	20
2.6. Retrieval Augmented Generation (RAG) Systems.....	25
2.7. Related Works (previous studies).....	30
CHAPTER 3 - RESEARCH METHODS.....	45

3.1. Type of Research	45
3.2. Data Analysis Techniques	46
3.3. Research Framework	47
3.4. Evaluation	51
3.5. Validation.....	51
3.6. Time Line.....	51
3.7. The Validator Criteria.....	56
3.8. Success Criteria.....	56
3.9. FGD Question Framework For Legal Analysis and System Development...	57
3.10. Proof of Concept.....	58
CHAPTER 4 - RESULT AND DISCUSSION.....	60
4.1. Result	60
4.1.1. Architecture Vision.....	60
4.1.2. AI Application Product.....	65
4.1.3. FGD Result Discussion.....	69
4.1.3.1. Nugraha Pranadita P, as an Academic (Associate Professor), Lawyer, Legal consultant and Expert Testimony/Opinion	69
4.1.3.2. Syahrul Macmud, as an academic (Assistant Professor) & Appeal Judge.....	70
4.1.3.3. Edy Salim as an IT Practitioner, CTO	71
4.2. Discussion.....	73
4.2.1. TOGAF Framework Development for Legal LLM AI Integration in Indonesian Corruption Case Proceedings: Technical and Ethical Considerations ..	73
4.2.1.1. Business Architecture	73
4.2.1.2. Business Gap Capability	77
4.2.1.3. Technology Gap Capability	78
4.2.1.4. Information Gap Capability	78
4.2.2. Legal LLM AI Integration for Enhanced Case Management in Indonesian Corruption Proceedings	79
4.2.2.1. The Benefits of Implementing RAG in Legal LLM AI Architecture ..	79
4.2.2.2. Future Work: RAG Implementation in Indonesian Corruption Justice System	84

4.2.2.3.	Quality Assurance for Legal LLM AI.....	86
4.2.2.4.	A Solution Architecture Blueprint	87
4.2.2.5.	Reasons the Proof of Concept Focus based on the Architecture	90
	Model Developed.....	90
4.2.2.6.	Transforming Legal Processes: Objectives and Implementation.....	91
4.2.2.7.	Testing by Claude 3.5 Sonnet, an AI language model.....	92
4.2.3.	Strategic Approaches for Legal LLM AI Technology Adoption in Indonesian Corruption Court Proceedings	94
4.2.3.1.	Strategic AI Analysis Model.....	94
4.2.3.2.	Evaluating The Proof of Concepts Meeting The Objectives	96
4.2.3.3.	Simple Predicted Dekstop Menu of UI & UX	107
4.2.3.3.1.	Chatbot Features	109
4.2.3.3.2.	Sample Dialogue of Chatbot.....	110
4.2.4.	Future Research Direction: Technical Implementation and Validation	111
CHAPTER 5 – CONCLUSIONS AND RECOMMENDATIONS.....		113
5.1.	Conclusions.....	113
5.2.	Recommendations.....	113
REFERENCES		114
CURRICULUM VITAE		119
APPENDICES		120

LIST OF FIGURES

Figure 1. 1: Total Supreme Court Verdicts on August 24	1
Figure 1. 2: Fishbone Diagram	8
Figure 2. 1: Digital Transformation Key Driver (Anup, 2019)	11
Figure 2. 2 : Criminal Justice System Process in Indonesia	13
Figure 2. 3: Architecture Development Cycle (The Open Group, 2018)	21
Figure 2. 4: Retrieval Augmented Generation (RAG).....	26
Figure 3. 1: Research Framework.....	47
Figure 4. 1 : Retrieval Augmented Generation Architecture (RAG).....	80
Figure 4. 2: A Solution Architecture Blueprint.....	87
Figure 4. 3: Defendants Identity	98
Figure 4. 4 : Defendants Identity Query	99
Figure 4. 5 : Defendants First Indictment	99
Figure 4. 6 : Defendant First Indictment Query.....	99
Figure 4. 7 : Defendants Second Indictment.....	99
Figure 4. 8 : Defendants Second Indictment Query.....	99
Figure 4. 9 : Defendants Third Indictment.....	99
Figure 4. 10 : Defendant Third Indictment Query	100
Figure 4. 11 : Prosecutor Charges.....	100
Figure 4. 12 : Prosecutor Charges Query.....	101
Figure 4. 13 : Court of Appeal Decision.....	101
Figure 4. 14 : Court of Appeal Decision Query.....	102
Figure 4. 15 : Legal Argumentation/Reasoning of Court of Appeal Judges.....	103
Figure 4. 16 : Legal Argumentation/Reasoning of Court of Appeal Judges.....	104
Figure 4. 17 : Legal Argumentation/Reasoning of Court of Appeal Judges/Reasoning Query.....	104
Figure 4. 18 : AI Summarisation of Legal Argumentation/Reasoning Query	105
Figure 4. 19 : Member of Court of Appeal Judges	106
Figure 4. 20 : Member of Court of Appeal Judges Query	106
Figure 4. 21 : A Simple Predicted Desktop Menu (UI & UX)	107

Figure 4. 1 : Retrieval Augmented Generation Architecture (RAG).....	80
Figure 4. 2: A Solution Architecture Blueprint.....	87
Figure 4. 3: Defendants Identity	98
Figure 4. 4 : Defendants Identity Query	99
Figure 4. 5 : Defendants First Indictment	99
Figure 4. 6 : Defendant First Indictment Query	99
Figure 4. 7 : Defendants Second Indictment.....	99
Figure 4. 8 : Defendants Second Indictment Query	99
Figure 4. 9 : Defendants Third Indictment.....	99
Figure 4. 10 : Defendant Third Indictment Query	100
Figure 4. 11 : Prosecutor Charges	100
Figure 4. 12 : Prosecutor Charges Query	101
Figure 4. 13 : Court of Appeal Decision	101
Figure 4. 14 : Court of Appeal Decision Query	102
Figure 4. 15 : Legal Argumentation/Reasoning of Court of Appeal Judges.....	103
Figure 4. 16 : Legal Argumentation/Reasoning of Court of Appeal Judges.....	104
Figure 4. 17 : Legal Argumentation/Reasoning of Court of Appeal Judges/Reasoning Query.....	104
Figure 4. 18 : AI Summarisation of Legal Argumentation/Reasoning Query	105
Figure 4. 19 : Member of Court of Appeal Judges	106
Figure 4. 20 : Member of Court of Appeal Judges Query	106
Figure 4. 21 : A Simple Predicted Dekstop Menu (UI & UX)	107

LIST OF TABLES

Table 2. 1: Critical Review of Related Paper	30
Table 3. 1: Time Line.....	52
Table 4. 1 : Architecture Vision.....	63
Table 4. 2: AI Application Product.....	66
Table 4. 3: Business Architecture Gap Analysis.....	73
Table 4. 4: Strategic AI Analysis Model.....	95



LIST OF GRAPHICS

Graphic 2. 1: All Verdicts in Supreme Court	16
---	----

