IMPLEMENTATION OF RAG SYSTEM FOR ENHANCING THE EFFICIENCY OF HUMAN CAPITAL DIVISION IN ANSWERING EMPLOYEE QUESTIONS AT XL AXIATA

UNDERGRADUATE THESIS

Submitted as one of the requirements to obtain
Sarjana Komputer

By:
NATALIA DESY ANGGREANI P

001202200122

FACULTY OF COMPUTER SCIENCE

INFORMATICS STUDY PROGRAM

CIKARANG

AUGUST, 2025

Implementation of RAG System for Enhancing the Efficiency of Human Capital Division in Answering Employee Questions at XL Axiata

By

Natalia Desy Anggreani P
001202200122

Approved:

Dr. Deffa Rahadiyan, S.Si.	Rosalina, S.Kom., M.Kom.
Thesis Advisor	Program Head of Informatics

Prof. Dr. Ir. Wiranto Herry Utomo, M.Kom.
Dean of Faculty of Computer Science

STATEMENT OF ORIGINALITY

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

Name	: Natalia Desy Anggreani P
Student ID number	: 001202200122
Study Program	: Informatics
Faculty	: Computer Science

I hereby declare that my thesis/final project/business plan entitled **"Implementation of RAG System for Enhancing the Efficiency of Human Capital Division in Answering Employee Questions at XL Axiata"** 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, August 2025

(.....)

Natalia Desy Anggreani P

SCIENTIFIC PUBLICATION APPROVAL FOR ACADEMIC INTEREST

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

Name	: Natalia Desy Anggreani P
Student ID number	: 001202200122
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:

Implementation of RAG System for Enhancing the Efficiency of Human Capital Division in Answering Employee Questions at XL Axiata

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, August 2025

(.....)

Natalia Desy Anggreani P

ADVISOR APPROVAL FOR JOURNAL/INSTITUTION'S REPOSITORY

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

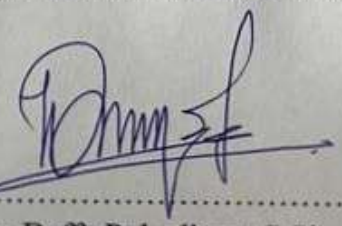
Name : Dr. Deffa Rahadiyan, S.Si.
ID number : 0425119801
Study program : Informatics
Faculty : Computer Science

declare that following thesis :

Title of thesis : Implementation of RAG System for Enhancing the Efficiency of Human Capital Division in Answering Employee Questions at XL Axiata
Thesis author : Natalia Desy Anggreani P
Student ID number : 001202200122

will be published in **journal / <u>institution's repository</u> / proceeding / unpublish**

Cikarang, 13 March 2026



(.....)
Dr. Deffa Rahadiyan, S.Si.

SIMILARITY INDEX REPORT

18% Overall Similarity

The combined total of all matches, including overlapping sources, for each database.

Filtered from the Report

- Bibliography
- Quoted Text

Match Groups

784 Not Cited or Quoted 18%
Matches with neither in-text citation nor quotation marks

7 Missing Quotations 0%
Matches that are still very similar to source material

0 Missing Citation 0%
Matches that have quotation marks, but no in-text citation

0 Cited and Quoted 0%
Matches with in-text citation present, but no quotation marks

Top Sources

9% Internet sources

4% Publications

16% Submitted works (Student Papers)

AI CHECK RESULTS

Natalia Natalia

Turnitin_Natalia

Quick Submit

Quick Submit

President University

Document Details

Submission ID
trn:oid:::1:3322024806

Submission Date
Aug 27, 2025, 4:53 PM GMT+7

Download Date
Aug 27, 2025, 4:59 PM GMT+7

File Name
revision_Natalia.pdf

File Size
1023.4 KB
96 Pages

14,172 Words

78,173 Characters

*% detected as AI

AI detection includes the possibility of false positives. Although some text in this submission is likely AI generated, scores below the 20% threshold are not surfaced because they have a higher likelihood of false positives.

Disclaimer

Caution: Review required.

It is essential to understand the limitations of AI detection before making decisions about a student's work. We encourage you to learn more about Turnitin's AI detection capabilities before using the tool.

Our AI writing assessment is designed to help educators identify text that might be prepared by a generative AI tool. Our AI writing assessment may not always be accurate (it may misidentify writing that is likely AI generated as AI generated and AI paraphrased or likely AI generated and AI paraphrased writing as only AI generated) so it should not be used as the sole basis for adverse actions against a student. It takes further scrutiny and human judgment in conjunction with an organization's application of its specific academic policies to determine whether any academic misconduct has occurred.

Frequently Asked Questions

How should I interpret Turnitin's AI writing percentage and false positives?
The percentage shown in the AI writing report is the amount of qualifying text within the submission that Turnitin's AI writing detection model determines was either likely AI-generated text from a large-language model or likely AI-generated text that was likely revised using an AI paraphrase tool or word spinner.

False positives (incorrectly flagging human-written text as AI-generated) are a possibility in AI models.

AI detection scores under 20%, which we do not surface in new reports, have a higher likelihood of false positives. To reduce the likelihood of misinterpretation, no score or highlights are attributed and are indicated with an asterisk in the report (*%).

The AI writing percentage should not be the sole basis to determine whether misconduct has occurred. The reviewer/instructor should use the percentage as a means to start a formative conversation with their student and/or use it to examine the submitted assignment in accordance with their school's policies.

ABSTRACT

Human Capital (HC) departments are often burdened with repetitive questions from employees regarding policies, benefits, procedures, and other administrative matters, so these routine tasks can divert valuable time and resources from strategic HC functions. This study aims to develop and implement an intelligent system that is capable of delivering accurate, relevant and context-aware responses through domain-specific chatbot using Retrieval-Augmented Generation (RAG) architecture, specifically designed to assist employees in the company policies domain. The system integrates a large language model developed by OpenAI with a curated internal knowledge base consisting of company policies and Human Capital-related documents. The RAG framework was selected for its ability to combine information retrieval with generative capabilities, enabling dynamic responses based on factual content. The findings show that the proposed chatbot significantly increased the accuracy and relevance of responses compared to traditional FAQ systems and general purpose chatbots. The domain-specific RAG chatbot demonstrates strong potential to enhance the operational efficiency of HC divisions. By leveraging OpenAI's advanced language model, the system represents a significant step forward in intelligent employee support and paving the way for more intelligent and responsive Human Capital services.

Keywords—Human Capital, Chatbot, Retrieval-Augmented Generation, OpenAI, Employee Assistance.

DEDICATION

I dedicate this capstone project to my family, my capstone team members, my advisors, and my lecturers for their continuous guidance and support. I also dedicate it to myself and to anyone who may use this project for educational purposes.

ACKNOWLEDGMENTS

First and foremost, I would like to express my deepest gratitude to God Almighty, Jesus Christ, for His endless grace, strength, and guidance throughout every step of this capstone journey. Without His presence, I would not have had the endurance and peace to complete this project.

I would also like to thank my family for their constant support, encouragement, and prayers throughout this journey. Your presence has meant a lot to me, and I truly appreciate everything you've done along the way.

My sincere appreciation goes to my academic advisor, Ma'am Rosalina, S.Kom., M.Kom. , and my capstone advisor, Ma'am Dr. Deffa Rahadiyan, S.Si., for their patience, guidance, and constructive feedback. Your support and insights have helped me grow both academically and personally throughout this project.

To my capstone team members, Muhamad Andika Hidayatullah and Rifki Immanuel Sinaga, thank you for the teamwork, late-night discussions, shared responsibilities, and collective effort. It has been a great experience working and growing together through challenges and breakthroughs.

To all my college friends, especially Shafira, Jelita, Safira, and Roulina — thank you for being part of my academic journey in President University. Your encouragement, shared challenges, and joyful moments have made this experience more meaningful and memorable.

To my church community and friends, thank you for your prayers, kindness, and constant reminders to stay grounded in faith amidst the pressure. Your support has truly been a blessing.

To EXO, thank you for your music, passion, and strength. You've been a surprising but steady source of energy, positivity, and motivation during long nights and stressful days. Sometimes, the smallest joys bring the biggest comfort.

Lastly, I would like to thank myself for staying committed, learning from every challenge, and continuing to move forward. This journey has been far from easy, but I’m grateful for the resilience and growth it has brought.

TABLE OF CONTENTS

Page

LIST OF TABLES

TABLE Page

LIST OF FIGURES

FIGURE Page