

RANCANG BANGUN CHATBOT AI SEBAGAI MEDIA LAYANAN INFORMASI AKADEMIK JURUSAN TEKNIK ELEKTRO

ABSTRACT

Academic information services at the Department of Electrical Engineering, Universitas Malikussaleh, face efficiency challenges due to the high frequency of repetitive inquiries from students regarding procedures, schedules, and administration, which currently rely on staff and faculty operational hours. To address this issue, this study aims to design and build an Artificial Intelligence (AI) mobile chatbot application named ROSI AI based on Retrieval-Augmented Generation (RAG) as a responsive, fast, and accurate academic information service medium. This study employs the Research and Development (R&D) method with a Waterfall development model comprising requirement analysis, system design, implementation, testing, and evaluation. The application was developed using the Flutter framework for the mobile frontend, Laravel for the backend, MySQL for the database, Python for executing RAG scripts, and the Gemini API as the Large Language Model (LLM). The chatbot's knowledge base originates from indexed official documents, including the Academic Handbook, departmental regulations, and the official websites of Universitas Malikussaleh and the Department of Electrical Engineering. The application of the RAG method retrieves relevant context from a vector database before being generated by the Gemini API to prevent AI hallucinations and ensure answers accurately align with official references. Functional testing results using Katalon Studio across 17 test scenarios (including registration, login, chatbot, chat history, edit profile, change password, and logout) achieved a 100% success rate (Passed). Furthermore, User Acceptance Testing (UAT) conducted with 53 student respondents yielded an average score of 83.94%, categorized as "Very Good". Thus, the ROSI AI application is proven to be successfully built and highly suitable for use as an efficient academic information service medium in the Department of Electrical Engineering at Universitas Malikussaleh.

Keywords: *Artificial Intelligence, Chatbot, Retrieval-Augmented Generation, ROSI AI, Academic Information Service.*