

ABSTRACT

The inefficiency in information delivery by the Quality Assurance Unit (SPM) has resulted in less responsive services. Therefore, there is a need for a chatbot that can respond quickly and accurately. This study focuses on the development of a deep learning-based chatbot using the BERT architecture to support the services of the Quality Assurance Unit (SPM). The objective is to optimize data retrieval and ensure efficient information delivery to users. The methodology involves collecting raw data from SPM (Research, Community Service, Achievements, Students, and Lecturers from 2019 to 2024), data preprocessing (tokenization, padding, label encoding), and developing a BERT-based model integrated with the Telegram platform. Model evaluation through 15 experiments demonstrated optimal performance under certain configurations, achieving high accuracy and low error rates, as evidenced by a positive class F1-score of 0.9831. Although minor inconsistencies were found in one black-box testing scenario and a cold start occurred in the chatbot's initial response, overall user questionnaire results indicated high satisfaction with ease of use and response speed. The implementation of this chatbot is expected to enhance the efficiency of SPM services, although further improvements such as increasing the variety of training data and deploying the system to a dedicated server are required for optimal performance.

Keywords: *Chatbot, Deep Learning, BERT (Bidirectional Encoder Representations from Transformers), Natural Language Processing, Blackbox Testing, Telegram.*