

ABSTRAK

Atha An Naufal 2025. Implementasi Chatbot Berbasis Natural Language Processing dengan Model Artificial Neural Network dan Optimasi Stochastic Gradient Descent pada Website Penerimaan Mahasiswa Baru Universitas Bhinneka Nusantara. Tugas Akhir, Program Studi Informatika (S1), Universitas Bhinneka Nusantara, Pembimbing: Arif Tirtana.

Kata kunci: Chatbot, NLP, ANN, SGD, TF-IDF, layanan Penerimaan Mahasiswa Baru

Perguruan tinggi saat ini menghadapi tantangan dalam menyediakan informasi Penerimaan Mahasiswa Baru yang responsif secara real-time. Penelitian ini bertujuan mengimplementasikan chatbot berbasis NLP menggunakan model *Artificial Neural Network* yang di optimasi menggunakan *Stochastic Gradient Descent* untuk dapat mengatasi kendala tersebut, dengan maksud bahwa dengan mengimplementasikan chatbot dapat meningkatkan layanan informasi. Analisis dilakukan terhadap data pertanyaan umum yang sering ditanyakan calon mahasiswa, diikuti perancangan sistem dan arsitektur ANN, serta pengujian performa model. Dalam tahap pembuatan model ANN terdapat penggunaan *Term Frequency – Inverse Document Frequency* (TF-IDF) untuk representasi numerik agar untuk proses *training* dapat diolah oleh model ANN. Hasil implementasi chatbot pada website PMB Ubhinus berhasil menyediakan informasi secara real-time dan relevan. Hasil pengujian menunjukkan akurasi model sebesar 92,5% dan F1-Score 91.56%, menunjukkan kemampuan klasifikasi yang baik. Dapat disimpulkan bahwa chatbot ini efektif dalam mempermudah akses informasi seputar Penerimaan Mahasiswa Baru di UBHINUS.

ABSTRACT

Atha An Naufal, 2025. Implementation of Chatbot Based on Natural Language Processing with Artificial Neural Network Model and Stochastic Gradient Descent Optimization on the New Student Admissions Website of Bhinneka Nusantara University. Final Project, Study Program informatics S1 Universitas Bhinneka Nusantara, Advisor 1 : Arif Tirtana

Keyword: Chatbot, NLP, ANN, SGD, TF-IDF, New Student Admissions service

Universities currently face challenges in providing responsive real-time New Student Admissions information. This study aims to implement an NLP-based chatbot using an Artificial Neural Network model optimized with Stochastic Gradient Descent to overcome these obstacles, with the intention that implementing a chatbot can improve information services. Analysis was carried out on data from frequently asked questions by prospective students, followed by the design of the ANN system and architecture, and model performance testing. In the ANN model creation stage, Term Frequency – Inverse Document Frequency (TF-IDF) was used for numeric representation so that the training process could be processed by the ANN model. The results of the chatbot implementation on the Ubhinus PMB website successfully provided real-time and relevant information. The test results showed a model accuracy of 92.5% and an F1- Score of 91.56%, indicating good classification capabilities. It can be concluded that this chatbot is effective in facilitating access to information regarding New Student Admissions at UBHINUS.