

# An Authority-First Hybrid Academic Chatbot for Reliable Institutional Query Handling and Admission Workflow Automation

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## Abstract

Handling a large volume of admission-related queries has become a significant operational challenge for administrative departments in higher education institutions. Existing chatbot systems predominantly rely on generative AI-based techniques that may provide responses without validating institutional data sources, thereby affecting the reliability of shared information. To address this limitation, this project proposes an Authority-First Hybrid Academic Chatbot for institutional query handling and admission workflow support.

The system primarily retrieves information from institutionally verified data repositories to ensure accuracy and consistency in communication. In scenarios where relevant information is temporarily unavailable, a Natural Language Understanding (NLU)-based fallback mechanism is utilized to provide uninterrupted user assistance. The proposed chatbot supports essential admission-related processes including eligibility verification, OTP-based user authentication, and application status tracking through rule-based logic to maintain transparency in workflow automation.

Real-time communication between system components is implemented using WebSocket technology to improve response time and interaction efficiency. Experimental evaluation with performance analysis in a simulated institutional enquiry environment indicates improved response consistency and reduced manual administrative workload. The system maintains a clear separation between conversational assistance and institutional decision-making processes to prevent automated influence on admission outcomes.

**Keywords:** Academic Chatbot, Admission Automation, Institutional Data Retrieval, Natural Language Understanding, WebSocket Communication, Workflow Automation