

ABSTRACT

Telkom University language center services continue to experience increasing demand as the number of users increases, both from the academic community and the general public. This situation causes the existing service system, particularly the call center, to experience an overload, resulting in slow response times to incoming calls. Limited staffing and operational hours are major obstacles to maintaining quality customer service.

As a solution, an automated call center system based on Artificial Intelligence (AI) was developed that can partially replace the functions of human operators. This system is built using Asterisk as an IP PBX server, GoIP as a GSM gateway, and an integration of cloud services based on Microsoft Azure Cognitive Services for speech-to-text (STT) and text-to-speech (TTS), as well as OpenAI for natural language processing. The system is designed to receive voice calls, process conversations in real time, and provide automated responses without human intervention.

Based on testing results, the system is able to answer calls with an average response time of 2.7 seconds. The system can also handle up to 10 calls simultaneously without significant performance degradation. In terms of security, the Fail2Ban feature and NSG settings successfully protect the system from unauthorized access. Overall, this system is capable of improving operational efficiency and delivering adaptive and sustainable customer service solutions.

Keywords: Artificial Intelligence, Asterisk, Call Center, GoIP, GSM gateway, Microsoft Azure Cognitive Services, OpenAI