

Implementation and on-premise deployment of a Secure On-Premise RAG-Based Conversational AI System for providing assistance to IPR's Administration

Abstract

This project focuses on the design, implementation and deployment of an AI-based chatbot aimed at supporting organizational administrative activities. The proposed system enables employees to interact with an intelligent, web-based virtual assistant using simple natural language to seek information related to administrative rules, policies, and procedures. The solution incorporates secure user authentication and role-based authorization mechanisms, ensuring that only authorized employees can access the system and that information is provided in accordance with user roles and permissions. All responses generated by the chatbot are strictly derived from official organizational policy documents, ensuring accuracy, consistency, and reliability of information. The system operates by identifying relevant content from these documents and generating context-aware, user-friendly responses using locally hosted Large Language Models (LLMs). Key information from policy documents is indexed and stored in a local vector database, enabling fast, efficient, and semantically meaningful retrieval. The chatbot manages conversation flow and user sessions automatically to ensure a smooth and intuitive interaction experience. The entire solution is deployed on on-premise infrastructure utilizing NVIDIA GPU resources, ensuring high performance while maintaining data privacy, security, and cost efficiency through the use of free and open-source technologies. A lightweight and user-friendly custom interface allows employees to quickly access administrative information without the need to physically visit the administrative office, thereby improving efficiency, accessibility, and overall organizational productivity.

Academic Project Requirements:

1) Required No. of student(s) for academic project: 1

2) Name of course with branch/discipline: B.E./B.Tech. Computer Engineering/IT/MCA

3) Academic Project duration:

(a) Total academic project duration: 12 Weeks

(b) Student's presence at IPR for academic project work: 3 Full working Days per week

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