

GENAI AGENTIC HR ASSISTANT

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ABSTRACT

The GenAI Agentic HR Assistant is an AI-driven application designed to optimize and automate HR management tasks using cutting-edge technologies. By integrating MongoDB for structured employee record management, Large Language Models (LLMs) —specifically Groq-Mistral for natural language processing, and LangChain agentic workflows for intelligent decision making, this system provides an efficient and scalable HR solution. The application enhances workforce management by streamlining employee record handling, facilitating dynamic team formation, and enabling intuitive natural language query resolution. With its agentic AI capabilities, the GenAI Agentic HR Assistant improves HR efficiency, reduces manual workload, and enhances decision-making processes, making it a valuable tool for modern organization.

1. INTRODUCTION

The GenAI Agentic HR Assistant is an AI-powered HR management solution designed to optimize and automate HR processes. This system integrates advanced technologies such as MongoDB, Large Language Models (LLMs) like Groq-Mistral, and LangChain agentic workflows to enhance efficiency in employee record management, team formation, and natural language query resolution.

This system analysis aims to evaluate the functional and non-functional requirements, identify potential challenges, and define the overall system architecture for seamless HR operations.

Our system includes the following key features:

- **Employee Record Management:** Efficiently store, update, and access employee details for seamless HR operations.
- **AI-Powered Team Formation:** Generate optimal team structures based on predefined HR parameters to enhance collaboration.
- **Intelligent Query Resolution:** AI-driven chatbot provides instant responses to HR-related inquiries, improving accessibility and support.

By leveraging these technologies, the proposed system enhances HR operations by efficiently managing employee records, optimizing team formation through AI-driven analysis, and improving accessibility with an intelligent query resolution system. This ensures streamlined workforce management, better collaboration, and seamless HR support.

2. LITRATURE REVIEW

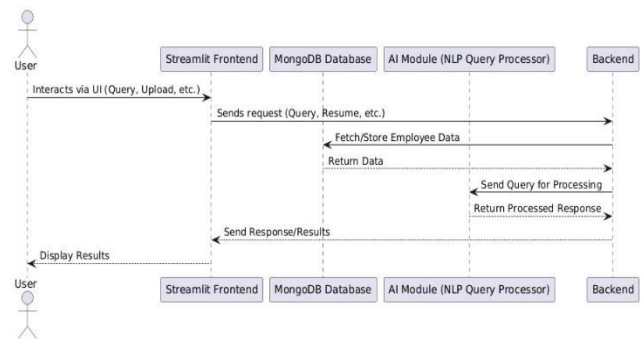
Several studies have explored AI-driven approaches to enhance HR processes, particularly

in employee record management, AI-driven team formation, and natural language query resolution. Guerra and de Lara's (2024) article, *Conversational AI in HR Management*, examines how AI-powered chatbots improve hiring and onboarding by automating HR inquiries, cutting down on workload, and increasing document processing efficiency. *MongoDB-Based AI Recruitment Systems* – Shobika et al. (2024) present an AI-driven employee recruitment platform utilizing MongoDB for resume screening and sentiment analysis. The system improves hiring efficiency by enabling seamless data storage and retrieval. *Groq-Mistral: High-Performance LLM for HR Applications* – Lee et al. (2022) present Groq-Mistral, a high-performance large language model designed for complex NLP tasks, including HR applications. The model improves automated HR processes such as recruitment, employee query resolution, and document analysis by leveraging advanced NLP capabilities. Web-based applications are also enhancing employee engagement, as noted by Tse et al. (2019), who explore machine learning-powered platforms that streamline HR processes. Additionally, Jhala (2024) examines how AI-driven workflows in HR decision-making help automate knowledge transfer and strategic planning. These studies highlight AI's role in managing employee records, optimizing team formation, and enhancing HR query resolution. While AI improves efficiency and automation in HR, it also presents ethical and regulatory challenges that require careful oversight

3. SYSTEM ARCHITECTURE

3.1 Frontend (User Interface)

The frontend is a Streamlit UI that enables users, including HR staff, employees, and administrators, to interact with the system. Users can submit natural language queries to retrieve employee records, performance reviews, or request team suggestions.



3.2 The NLP Chatbot process

The NLP Chatbot processes the user's natural language queries and translates them into structured data requests. It communicates with the Agentic AI Engine, which handles tasks like team formation and performance analysis, providing intelligent recommendations based on employee

3.3 Backend

At the backend, MongoDB serves as the database, storing employee information, performance reviews, HR queries, and other related data. MongoDB's flexible document-based structure makes it ideal for storing semi-structured data, allowing efficient retrieval and updates.

4. IMPLEMENTATION

The GenAI Agentic HR Assistant is an innovative AI-driven application that revolutionizes HR management.

By leveraging MongoDB, Groq-Mistral, and LangChain agentic workflows, it aims to streamline and automate HR tasks, enhance workforce management, and improve decision-making processes.

1. Technology Stack

- Groq-Mistral : Large Language Models (LLMs) for natural language processing.
- LangChain : Agentic workflows for intelligent decision-making.
- Python: Programming language for developing the application

2. Database Setup and Configuration

2.1. Choosing MongoDB

MongoDB is chosen for its flexibility, scalability, and ability to handle structured, semi-structured, and unstructured data in BSON format. This makes it ideal for managing complex HR data dynamically.

2.2. Database Structure

Key collections used in MongoDB:

- **Employees Collection** (`employees`): Stores individual employee details (skills, roles, performance).
- **Teams Collection** (`teams`): Stores information about different teams and their skill requirements.
- **Job Roles Collection** (`job-roles`): Defines job descriptions and required competencies.
- **Performance Reviews Collection** (`performance-reviews`): Stores employee performance metrics over time.

2.3. Database Setup Steps

- **Install MongoDB:** Follow the official MongoDB installation guide.
- **Start MongoDB Service:** Launch the MongoDB service.
- **Create a New Database:** Use the MongoDB shell or a GUI tool like MongoDB Compass to create a new database.
- **Create Collections and Insert Sample Data:** Define the structure and insert initial data into the collections.
- **Connect MongoDB with LangGraph:** Establish a connection between MongoDB and LangGraph for querying and managing data.

3. Natural Language Processing with Groq-Mistral

Assistant to understand and respond to natural language queries from users.

4. Agentic Workflows with LangChain

Implement LangChain agentic workflows to facilitate intelligent decision-making. These workflows help automate HR processes, such as dynamic team formation and performance analysis.

5. Streamlit Application Development

Develop a user-friendly interface using Streamlit to interact with the GenAI Agentic HR Assistant. This interface will allow HR personnel to manage employee records, form teams, and analyze performance metrics.

6. Additional Components

● String Generator & Embedding Generator

Develop components to generate strings and embeddings for natural language processing tasks.

● Vector Database Setup

Set up a vector database to store and retrieve embeddings for efficient querying.

● Tools Definition

Define tools and utilities required for various HR tasks, such as team formation and performance analysis.

● Fine-Tuning

Fine-tune the LLMs and workflows to improve accuracy and efficiency.

● Agent Workflow

Design and implement agent workflows to handle different HR scenarios.

5. RESULTS

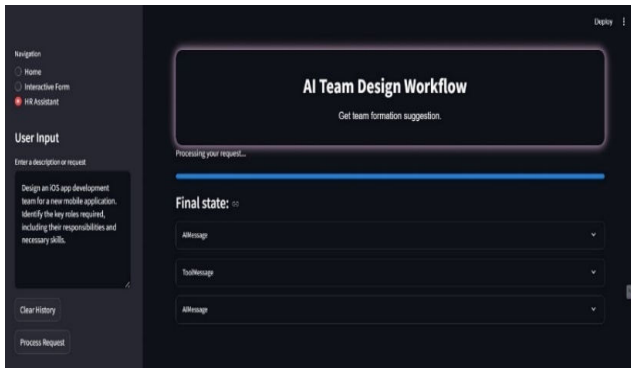
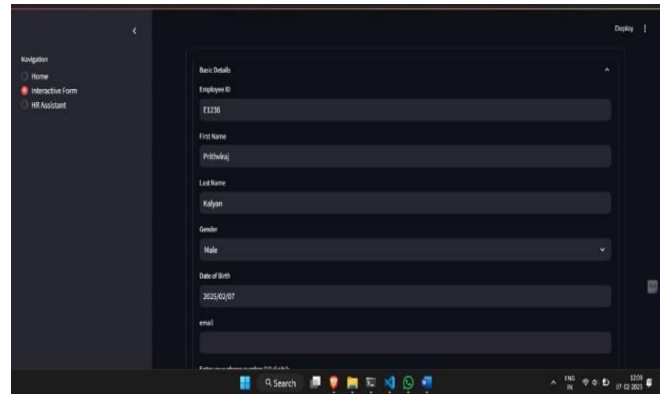


Fig 5.1 Team formation suggestion

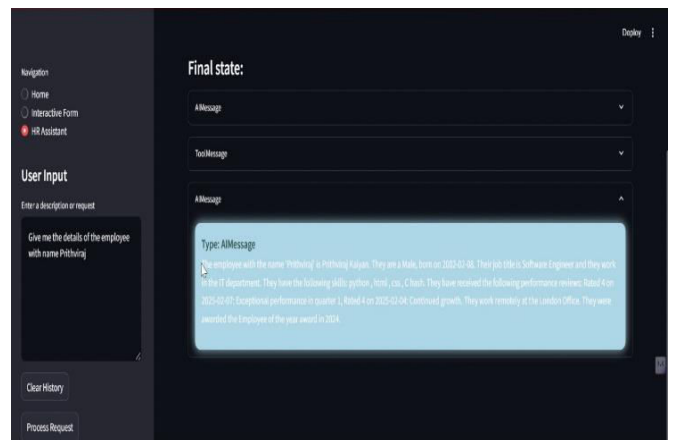


Fig 5.2 Employee data management

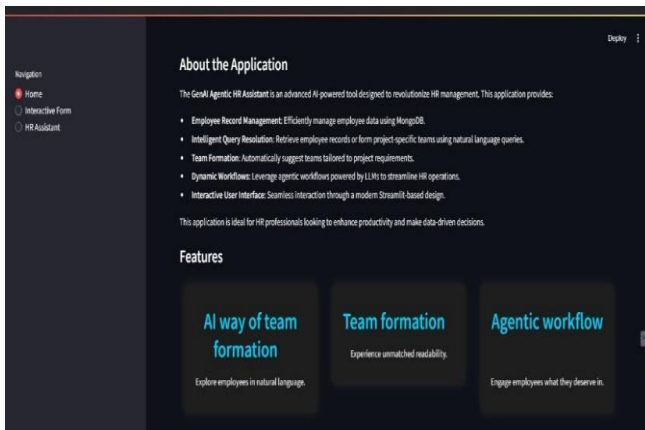


Fig 5.3 Application Home

Fig 5.4 Application Form

6. CONCLUSION

The Agentic HR Assistant project successfully integrates artificial intelligence and natural language processing (NLP) to revolutionize how Human Resources (HR) teams manage employee data, identify talent gaps, and optimize team formations. By utilizing Groq's language model, LangChain, and MongoDB for data management, the system enables HR personnel to efficiently access, query, and analyze employee data, leading to quicker and more informed decision-making processes.

The HR assistant helps streamline team formation for specific projects, ensuring that teams are composed of individuals with complementary skills. Additionally, the system's ability to suggest talent development areas, based on skill gaps, offers valuable insights for HR planning and resource allocation.

Overall, the project meets its objectives of creating an intelligent, agentic system capable of improving workforce management, boosting productivity, and enhancing the overall HR experience. The chatbot's intuitive user interface and seamless data interaction ensure that HR staff can navigate the system with minimal training or technical expertise.

7. REFERENCES

[1] **Guerra, E., & de Lara.** (2024). Conversational Assistants for Software Development: Integration, Traceability, and Coordination.

[2] **Prasad, K.D.V., & De, T.** (2024). Generative AI as a Catalyst for HRM Practices: Mediating Effects of Trust.

[3] **Gaikwad, H.R., & Kiwelekar, A.W.** (2024). A Generative AI-Based Assistant to Evaluate Short and Long Answer Questions.

[4] **Sahin, G., Varol, K., & Pak, B.K.** (2024). LLM and RAG-Based Question Answering Assistant for Enterprise Knowledge Management.

[5] **Lee, J., et al.** (2022). Groq-Mistral: A High-Performance LLM.

[6] **Mocean, L., & Vlad, M.P.** (2024). The Use of Generative Technologies in E-Education.

[7] **Pugacheva, O.** (2024). Artificial Intelligence in Business and Society: Threats and Regulations.

[8] **Rahman, A., Votipka, D., & Lipford, H.R.** (2024). Using AI Assistants in Software Development: A Qualitative Study on Security Practices and Concerns.

[9] **Shobika, P., Amirthavarshini, S.B., & Venkadeswari, K.** (2024). Employee Recruitment Platform.

[10] **Dang, L.M.T.** (2025). Classroom Management System Integrated Chatbot AI.

[11] **Shams, I.R.** (2023). Human Resource Management System.

[12] **Tse, et al.** (2019). Web-Based Applications in HR.

[13] **Jhala, A.** (2024). Transferring AI Model to CLEAR Program for Enhanced Lessons Learned and Best Practices Selection.