

Project Title

Intelligent HR Policy & Talent Assistance System Using Agentic RAG

Problem Statement

Human Resources teams in medium to large organizations manage a vast amount of unstructured information, including HR policies, employee handbooks, recruitment guidelines, performance frameworks, learning resources, and compliance documents. These documents are frequently updated and dispersed across multiple repositories, making it difficult for HR professionals and employees to retrieve accurate, up-to-date information quickly.

Additionally, HR teams are expected to handle diverse queries such as policy clarifications, leave eligibility, onboarding procedures, performance review criteria, and talent-related insights, often under strict compliance and confidentiality constraints. Traditional keyword-based search systems fail to understand user intent, lack contextual awareness, and cannot provide precise, conversational answers.

The organization requires an **intelligent, conversational HR assistant** that can understand natural language queries, retrieve relevant information from internal HR knowledge bases, reason across multiple HR domains, and generate accurate, context-aware responses while maintaining traceability to source documents.

Proposed Solution

Design and implement an **Agentic HR Knowledge Assistant** using **Large Language Models (LLMs)** integrated with **LangChain, LangGraph, Retrieval-Augmented Generation (RAG), FAISS, and advanced prompt engineering techniques**.

The system will ingest HR documents, create vector embeddings, and store them in a FAISS vector database for efficient semantic search. A RAG pipeline will ensure responses are grounded in internal HR data, minimizing hallucinations and improving accuracy.

Multiple specialized AI agents will be orchestrated using **LangGraph**, each responsible for a specific HR function such as policy interpretation, recruitment assistance, compliance checks, and employee query resolution. The system will dynamically route user queries to the appropriate agent, enabling modular, scalable, and maintainable workflows.

Prompt engineering techniques, including role-based prompts, few-shot examples, and structured output prompts, will be applied to ensure consistent, professional, and compliant responses suitable for HR use cases.

Key Functional Capabilities

- Conversational querying of HR policies and employee handbooks
- Context-aware answers grounded in internal HR documents (RAG)
- Multi-agent reasoning for different HR domains (policy, hiring, compliance)
- Semantic search using FAISS vector store
- Traceable answers with source document references
- Scalable agent workflows using LangGraph

Technology Stack Alignment

- **LLM:** Gemini / OpenAI / LLaMA (configurable)
- **LangChain:** Prompt templates, chains, tool integration
- **LangGraph:** Agent orchestration and workflow routing
- **RAG:** Context injection from HR knowledge base
- **FAISS:** Vector storage and similarity search
- **Prompt Engineering:** Role-based, few-shot, and structured prompts

Expected Outcome

The final system will significantly reduce HR response time, improve accuracy of policy communication, and enhance employee experience through a reliable, AI-powered HR assistant. It will also demonstrate how modern **agentic AI architectures** can be applied to

real-world enterprise HR problems using open-source and cloud-native GenAI frameworks.

Solution Flow: Intelligent HR Policy & Talent Assistant

Tech Stack: Python, Gemini 1.5 Flash, LangChain, LangGraph, FAISS, RAG

1. Solution Architecture (Logical Flow)

User Query → Agent Router (LangGraph) → HR Domain Agent → RAG Pipeline → Gemini Flash → Final Answer + Sources

2. Core Components and Their Roles

2.1 LLM Layer (Gemini Flash)

- Handles reasoning, summarization, and response generation
- Uses prompt engineering for HR-safe, compliant outputs

3. HR Knowledge Ingestion (RAG Foundation)

3.1 Load HR Documents

3.2 Create Embeddings & Store in FAISS

4. Prompt Engineering (HR-Specific)

5. RAG Chain (Context-Grounded Answers)

6. HR Agents (Domain-Specific)

6.1 Policy Agent

6.2 Recruitment Agent

7. Agent Orchestration with LangGraph

8. Run the End-to-End System

9. What This Solution Achieves

Capability	Achieved
Semantic HR search	FAISS
Hallucination reduction	RAG
Multi-agent routing	LangGraph
HR-safe responses	Prompt engineering
Cost-efficient LLM	Gemini Flash

10. Real-World Value (HR Perspective)

- Faster HR query resolution
- Consistent policy communication
- Reduced manual HR workload
- Scalable agent-based HR automation

11. Possible Enhancements (Optional)

- Add **audit logs** for compliance
- Introduce **confidence score** in responses
- Integrate **Streamlit UI**
- Deploy on **Vertex AI / Cloud Run**
- Add **LangSmith monitoring**