



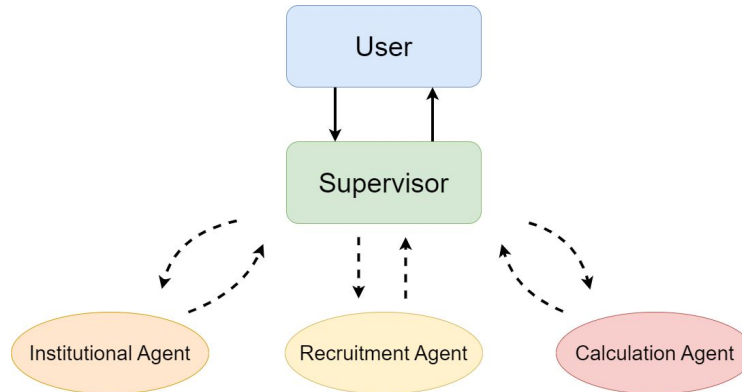
ML/AI project

HR Specialist Multi-Agent System

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System Overview

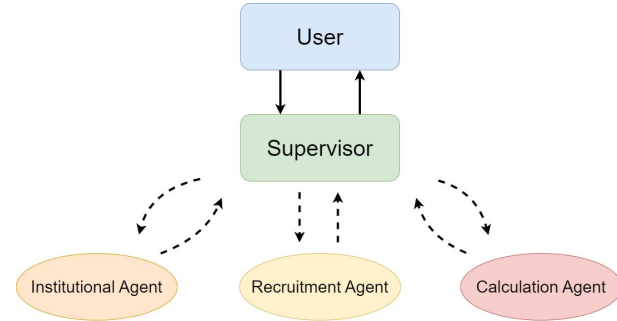
- **Multi-agent** system designed to enhance operations. It features specialized agents for handling **institutional inquiries**, **recruitment processes**, and **time-related calculations**.



Agents Functionalities

Institutional Agent

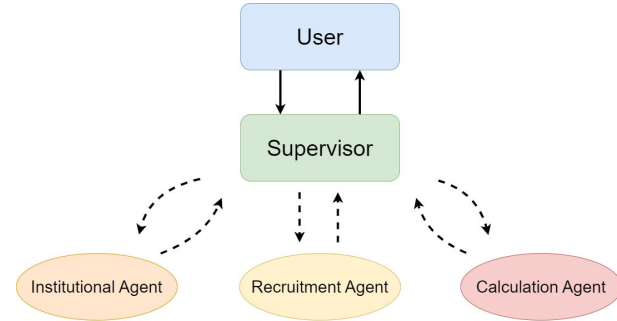
- **Function:** Handles queries related to company policies, benefits, and institutional guidelines through document consultation.
- **Technology:** Retrieval-Augmented Generation (RAG). Documents are loaded, split into chunks, and indexed for efficient retrieval. Relevant sections are retrieved and then integrated into the context of a text generation model, enabling the agent to deliver contextually accurate responses.



Agents Functionalities

Recruitment Agent

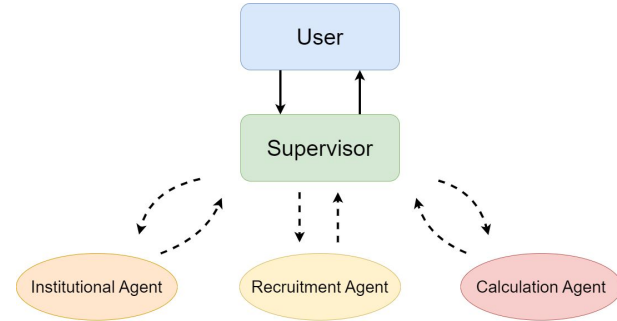
- **Function:** Manages candidate selection, including screening applications and assessing qualifications.
- **Technology:** Data summarization. Documents are loaded, summarized, and integrated into the context of a text generation model, enabling the agent to effectively evaluate candidate fit and provide comprehensive assessments.



Agents Functionalities

Calculation Agent

- **Function:** Performs time tracking calculations, such as computing daily working hours
- **Technology:** Custom agent tools. The agent uses specialized tools to calculate working hours from user clock punches and perform mathematical computations, all integrated with a chat model for dynamic and accurate time tracking.





Frameworks Used

- **LangChain:** For developing workflows with language models.
- **LangGraph:** For designing agent workflows with graph-based state management.
- **OpenAI models:** Smaller models choice for cost-effective and low latency generation.
 - LLMs: GPT-4o mini
 - Embeddings: text-embedding-3-small
- **Streamlit:** For building a web chat interface to interact with the system.
- **LangSmith:** For system monitoring.

Chat Interface

Y I am looking for candidates for a Machine Learning position. Could you help me evaluate which of our candidates is the best fit for this role? Important to have Python experience and TensorFlow.

G Based on the evaluations, John Doe is the strongest candidate for the Machine Learning position due to his extensive experience and relevant skills in Python and TensorFlow. Jane Smith and Michael Brown do not meet the necessary criteria for this role.

What about for a hardware product development role? Need someone with more than 5 years of experience.

G The most qualified candidate for the hardware product development role is Michael Brown, who has over 7 years of experience as a Hardware Engineer and specializes in PCB design, embedded systems, and FPGA development.

Tip here

localhost:8501
Deploy

I'm Guilda Agent, HR Specialist

Welcome to the HR Specialist! This application is designed to assist with various HR-related tasks. Here's how you can benefit from our specialized agents:

Institutional Agent: Handles inquiries related to company policies and institutional procedures. Get answers to questions about deadlines, benefits, and other HR guidelines.

Recruitment Agent: Manages the recruitment process by handling candidate selection and evaluation. This includes screening applications, assessing qualifications, and making hiring recommendations.

Calculation Agent: Performs calculations related to time tracking and working hours. It helps compute total hours worked, manage time logs, and carry out other time-related calculations.

Use these agents to streamline HR tasks, manage your workforce, and ensure efficient operations!

G Hi! How can I assist you today?

Which are all the employee benefits?

G The employee benefits offered by XYZ Company include: 1. **Health Plan:** A comprehensive health plan that covers medical consultations, tests, and hospitalizations. 2. **Dependent Coverage:** Optional dependent coverage is available as part of the health plan. 3. **Meal Voucher:** All employees receive a monthly meal voucher to help cover food expenses during working hours. 4. **Life Insurance:** All employees are covered by life insurance, with the option to include dependents. 5. **Childcare Assistance:** Assistance is provided for employees with young children to help with childcare expenses. 6. **Vacation:** Employees are entitled to 30 days of annual vacation,

Tip here

Monitoring - LangSmith

LangSmith dashboards offer an integrated view of system metrics for efficient performance monitoring and optimization:

- **Time Tracking:** Monitor process durations.
- **Cost Management:** Track and analyze system expenses.
- **Token Count:** Track token usage for optimization.
- **History Mapping:** Visualize and analyze historical data.

The screenshot displays the LangSmith interface. On the left, a 'TRACE' view shows a hierarchical execution graph for a 'LangGraph' run. The graph includes nodes such as 'supervisor', 'ChatOpenAI', 'JSONAgentOutputParser', 'supervisor_should_continue', 'institutional_agent', 'retrieval_chain', 'retrieve_documents', 'Retriever', 'stuff_documents_chain', 'format_inputs', 'format_docs', 'ChatPromptTemplate', 'ChatOpenAI', and 'supervisor'. Each node is annotated with its execution time and token counts. The 'Retriever' node is highlighted in blue.

On the right, a detailed view of the 'Retriever' node is shown. It includes tabs for 'Run', 'Feedback', and 'Metadata'. The 'Input' section displays a query: 'query: Please provide a detailed list of all employee benefits offered by the company.' The 'Rendered Output' section shows a list of documents retrieved, each with a title, a snippet, and a relevance score (e.g., 1, 3, +12).



Scalability

Deployment Options (to be implemented):

- **Cloud API:** Develop as a cloud-based API for remote access.
- **Local Application:** Implement as a standalone application for local execution.

Scalability Features:

- **Agent Expansion:** Easily add more agents.
- **Tool Integration:** Integrate additional tools into existing agents.
- **Model Customization:** Configure OpenAI models to better fit specific requirements.