CAPSTONE PROJECT

PROJECT TITLE

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OUTLINE

- **Problem Statement** (Should not include solution)

- **Proposed System/Solution**

- **System Development Approach** (Technology Used)

- **Algorithm & Deployment**

- **Result (Output Image)**

- **Conclusion**

- **Future Scope**

- **References**

PROBLEM STATEMENT

Interview Trainer Agent :

- In today's competitive job market, candidates struggle to prepare effectively for interviews due to:

- Lack of personalized guidance for different job roles and experience levels.

- Difficulty in finding role-specific technical questions and HR expectations.

- Absence of integrated platforms covering both technical and soft skills.

- Traditional resources being generic, outdated, and not adaptive to user profiles.

- This leads to low confidence, incomplete preparation, and reduced success rates in interviews.

PROPOSED SOLUTION

The proposed system aims to address the challenge of preparing candidates for job interviews by delivering personalized question sets and preparation strategies. This involves leveraging AI, RAG (Retrieval-Augmented Generation), and IBM Granite to generate tailored questions and answers accurately. The solution will consist of the following components:

1.Data Collection:

Gather job-specific interview questions, HR guidelines, and behavioral scenarios from recruitment portals, professional networks, and company interview databases.

Utilize industry expectations and role-based requirements to enhance question relevance.

2. Data Preprocessing:

Clean and organize the collected data to remove duplicates, inconsistencies, and outdated questions.

Create embeddings and index the data for fast retrieval using vector databases.

3. AI Algorithm:

Implement a Retrieval-Augmented Generation approach where:

Relevant content is retrieved using semantic search.

IBM Granite model generates personalized question sets and model answers.

Include technical questions, HR scenarios, and soft skill assessments.

4. Deployment:

Develop a user-friendly web interface for uploading resumes or entering job roles.

Deploy the solution on IBM Cloud Lite for scalability, performance, and security.

Integrate API endpoints for question retrieval and generation.

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- **Evaluation:**

- **Assess the system's performance using metrics like:**

   Question relevance score.

   User satisfaction rating.

- **Fine-tune the model based on user feedback and real-world testing.**

- **Result:**

- **Generate role-specific question sets, model answers, and improvement tips.**

- **Provide both technical and soft skill-based practice sessions.**

SYSTEM APPROACH

The Interview Trainer Agent uses a combination of AI-driven architecture and cloud-based deployment to deliver personalized interview preparation. The technologies used are:

- Architecture:-

  Retrieval-Augmented Generation (RAG): Combines document retrieval and generative AI for personalized question generation.

  Modular Design: Separate layers for data retrieval, model generation, and user interface.

- AI Model:-

  IBM Granite Foundation Model: For natural language understanding and generating customized interview questions and answers.

- Cloud Platform:-

  IBM Cloud Lite Services: For application hosting, scalability, and storage.

- Data Management:-

  Knowledge Base: Curated data from recruitment portals, HR guidelines, company-specific interviews.

  Vector Database: For semantic search and fast retrieval of relevant interview content.

- Programming & Frameworks:-

  Python: Core programming language for model integration and backend development.

  LangChain: For implementing the RAG pipeline (retrieval + generation).

  Flask / Streamlit: For building an interactive web-based user interface.

- Deployment Tools:-

  Containerization: Docker for portability and easy deployment.

  API Integration: REST APIs to connect the retrieval module, model, and frontend.

ALGORITHM & DEPLOYMENT

- **Algorithm Selection:**

  - The chosen algorithm is based on Retrieval-Augmented Generation (RAG) because it combines:-

  - Document Retrieval: Fetches relevant interview questions and HR guidelines from the knowledge base.

  - Generative AI: IBM Granite generates personalized question sets and model answers.

  - Justification: RAG ensures accuracy, contextual relevance, and personalization, which is critical for interview preparation.

  Data Input:

  - User Inputs: Job role, experience level, and optionally a resume.

  - Knowledge Base Inputs:-

    Technical interview questions by job category.

    Behavioral and HR questions from company databases.

    Industry-specific guidelines.

- Training Process:

- IBM Granite is a pre-trained foundation model; fine-tuned for interview-related responses using:

    1. Curated question-answer pairs.

    2.HR guidelines and role-specific expectations.

- Retrieval system built using vector embeddings for semantic similarity search.

- Prediction Process:

- **Step 1:** Retrieve relevant questions and guidelines using semantic search from the knowledge base.

- **Step 2:** IBM Granite generates:
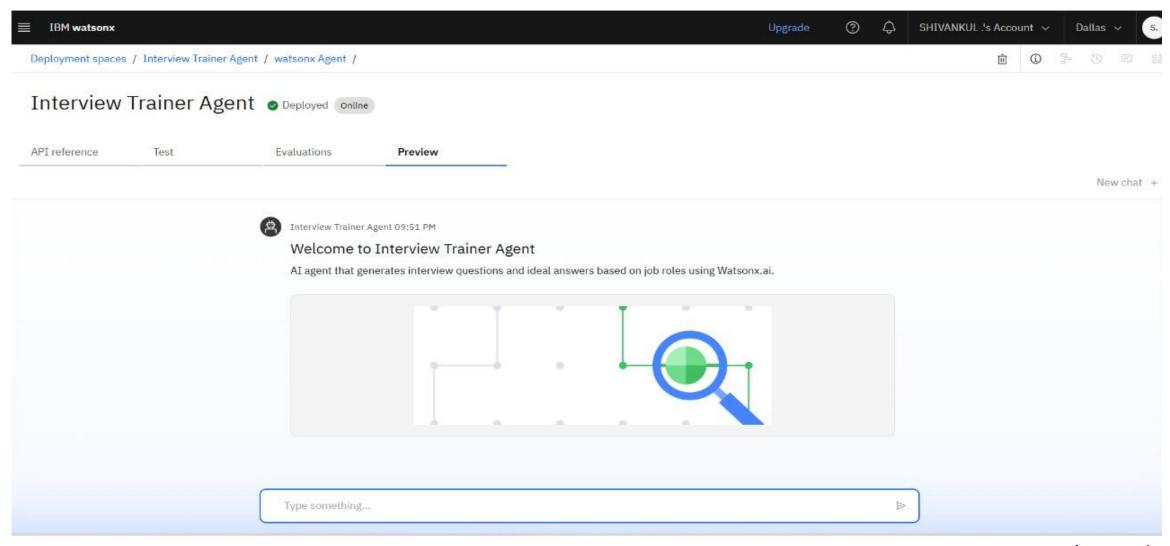
    Role-specific technical questions.

    Behavioral scenarios with model answers.

    Improvement tips for better performance.

    Step 3: Output presented through a user-friendly web interface.

RESULT

Deployment spaces / Interview Trainer Agent / watsonx Agent /

Interview Trainer Agent ✓ Deployed Online

API reference   Test   Evaluations   **Preview**

New chat +

S You 09:55 PM

Give me 5 technical and 3 HR questions for the role of Data Engineer.

Interview Trainer Agent 09:55 PM

Here are 5 technical and 3 HR questions for the role of Data Engineer:

Technical Questions:

1. What is data modeling, and how do you approach it in your work as a Data Engineer?
2. Explain the difference between structured data and unstructured data, and provide examples of each.
3. How do you design a data pipeline, and what factors do you consider when choosing a tech stack?
4. What are some challenges you've faced operationally in your previous roles, and how have you overcome them?
5. How do you ensure data quality and integrity in your work as a Data Engineer, and what tools or techniques do you use to achieve this?

Type something...   ▷

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Interview Trainer Agent ✅ Deployed Online

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New chat +

5. How do you ensure data quality and integrity in your work as a Data Engineer, and what tools or techniques do you use to achieve this?

HR Questions:

1. What makes you the best candidate for this Data Engineer position, and what qualities do you think are essential for success in this role?

2. Can you describe your daily responsibilities as a Data Engineer, and how you prioritize your tasks and manage your time?

3. Why do you want to work as a Data Engineer, and what motivates you to work in this field?

These questions are designed to assess the candidate's technical skills, experience, and approach to data engineering, as well as their soft skills, motivation, and fit for the role.

▶ How did I get this answer?

↻

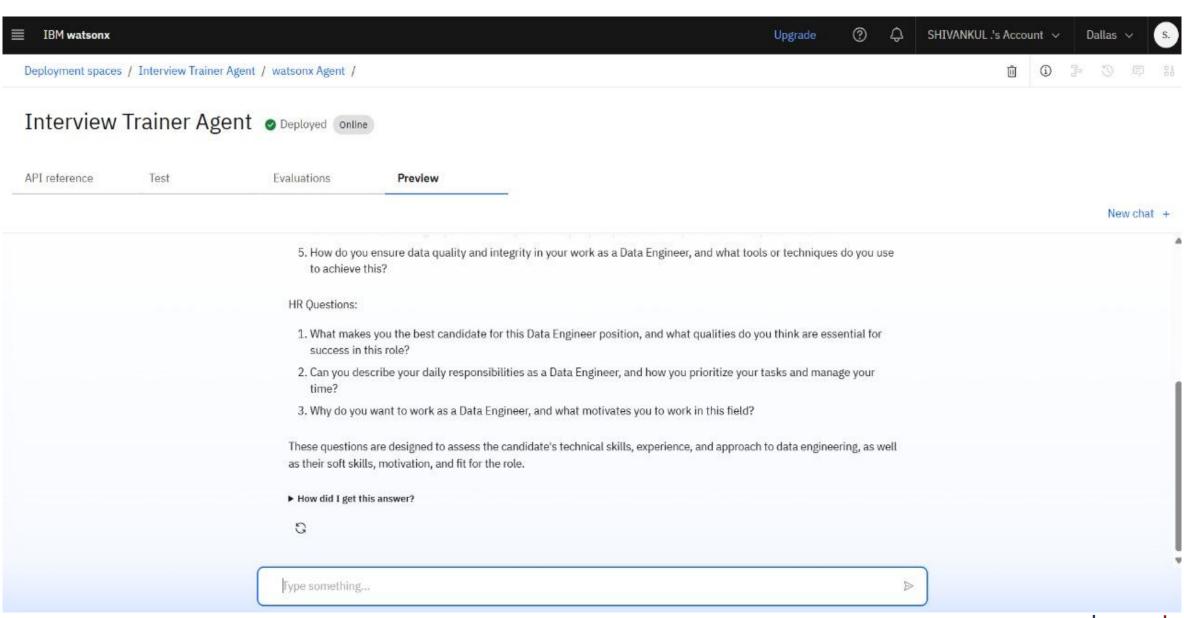Type something...   ▷

CONCLUSION

- **Bridges the Preparation Gap:** Provides personalized interview preparation that traditional methods fail to offer.

- **AI-Driven Accuracy:** Uses IBM Granite and RAG architecture for generating relevant and context-specific questions.

- **Comprehensive Coverage:** Includes technical, HR, and soft skills, ensuring holistic readiness.

- **Enhanced Confidence:** Interactive approach boosts candidate confidence for real interviews.

- **Scalable & Cloud-Based:** Deployed on IBM Cloud Lite for secure, scalable, and reliable performance.

- **Improved Success Rate:** Increases candidate's chances of clearing competitive job interviews.

FUTURE SCOPE

- **Voice-Based Interview Simulation:** Integrate speech recognition and AI for real-time mock interviews.

- **Gamified Learning**: Add interactive quizzes and rewards to make preparation engaging.

- **Integration with Job Portals**: Connect with LinkedIn, Naukri, and Indeed for profile-based question generation.

- **AI-Powered Scoring System**: Provide automated performance scoring and analytics for improvement tracking.

- **Multi-Language Support**: Enable interview preparation in multiple languages for global users.

- **Real-Time Market Trend Updates**: Continuously update the knowledge base with trending questions from the job market.

REFERENCES

- IBM Cloud Documentation – https://cloud.ibm.com/docs

- IBM Granite Foundation Model – https://www.ibm.com/granite

- LangChain Framework for RAG – https://www.langchain.com

- Indeed – https://www.indeed.com

- HR Interview Guidelines – SHRM – https://www.shrm.org

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IBM CERTIFICATIONS

In recognition of the commitment to achieve professional excellence

Getting Started with
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Has successfully satisfied the requirements for:

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Completion Certificate

This certificate is presented to

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for the completion of

Lab: Retrieval Augmented Generation with LangChain

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 24 Jul 2025 (GMT)

Learning hours: 20 mins

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THANK YOU