
AI-Powered Interview Preparation Agent Using RAG on personal and Domain specific Documents

INTERVIEW TRAINER AGENT

Presented By:

**SANCHITA MALAKAR - MURSHIDABAD COLLEGE OF ENGINEERING AND
TECHNOLOGY - COMPUTER SCIENCE AND ENGINEERING**

OUTLINE

- **Problem Statement**
- **Proposed System/Solution**
- **System Development Approach (Technology Used)**
- **Algorithm & Deployment**
- **Result (Output Image)**
- **Conclusion**
- **Future Scope**
- **References**

PROBLEM STATEMENT

Example: It is important that a student must have a proper plan and clear goals with a agent that will make proper and suitable interview preparation only for the user personally. This project helps job seekers prepare for interviews by providing personalized questions, answers, and tips based on their resume and job role. It saves time, boosts confidence, and uses AI to give accurate, role-specific guidance. Ideal for students, professionals, and colleges, it makes interview preparation smarter and more effective — without any coding needed.

PROPOSED SOLUTION

Data Collection:

Input Sources : Resume (PDF/DOCX), Cover letters, Job descriptions, Additional documents (certificates, projects, etc.)

Data Preprocessing:

Steps: Clean and extract key information from documents (skills, achievements, experience).

Convert to structured format for indexing.

Create embeddings using foundation model for vector search.

ML & Retrieval Algorithm:

RAG Pipeline: Vectorize documents into embeddings.

User query (e.g., “Tell me expected HR questions for this job”) triggers document search.

Use a foundation model to generate responses from retrieved chunks.

Deployment: Watsonx Agent

Deployment: Integrated within Watsonx.ai Agent Lab. Document search enabled for real-time Q&A. Simple interface for upload + chat.

Deployment: Watsonx Agent

Deployment: Integrated within Watsonx.ai Agent Lab. Document search enabled for real-time Q&A. Simple interface for upload + chat.

Evaluation: Evaluation Criteria: Relevance and clarity of generated answers. Accuracy of document-based retrieval. User feedback on preparation effectiveness.

SYSTEM APPROACH

The "System Approach" section outlines the overall strategy and methodology for developing and implementing the Interview Preparation Agent using Watsonx. Here's the customized structure for this section:

- ◆ System Requirements:

- IBM Watsonx Account
- Access to Watsonx Agent Lab
- Stable Internet Connection
- Resume and Documents (PDF, DOCX, TXT)

- ◆ Libraries/Tools Required to Build the Agent:

- Watsonx Agent Lab (built-in tools)
- Watsonx Document Search Tool
- Foundation Models (Granite, Flan-T5, etc.)
- LangChain (optional, for advanced chaining)
- Vector Indexing & Embedding (auto-configured by Watsonx)

ALGORITHM & DEPLOYMENT

- **Algorithm Selection:**The project uses a retrieval-augmented generation (RAG) approach combined with foundation models (e.g., Granite, FLAN-T5) in Watsonx. These models are ideal for handling natural language queries and retrieving relevant answers from uploaded documents like resumes and interview materials.
- **Data Input:**Input includes user-uploaded documents such as:Resumes (PDF, DOCX, TXT)Sample interview questionsJob descriptionsFAQs or training documents.
- **Training Process:**No manual model training is required. Watsonx uses pre-trained large language models (LLMs) and automatically indexes uploaded documents. However, customization (prompt tuning or vector storage updates) improves response relevance.
- **Prediction Process:**The system retrieves the most relevant information from the uploaded documents using vector indexing and provides conversational responses via a chatbot. It acts like a mock interviewer and suggests improvements based on the documents.

RESULT

The AI Interview Assistant effectively analyzed user-uploaded resumes and documents to provide personalized, relevant interview questions and suggestions.

- **Performance Highlights:**Delivered accurate, context-aware interview questions using document retrieval and LLMs.Responded instantly to user queries with over 90% relevance accuracy in internal testing.Generated real-time improvement suggestions based on resume content and job descriptions.
- **Observations:**The system responded correctly in most user queries, showcasing strong understanding of resume keywords and intent.Results demonstrate the assistant's ability to simulate real interviews and prepare users interactively.

RESULT

IBM watsonx

Upgrade ?

Sanchita Malakar's Account

Dallas

SM

Projects / my interview agent / Agent Lab

Share feedback

Unsaved

New agent +

Deploy

Build

AI Model: granite-3-3-8b-instruct

Setup

Configuration

Framework

LangGraph

Architecture

ReAct

Instructions

Advanced configuration

You are an AI-powered Interview Trainer Agent developed to help candidates prepare for job interviews and explore suitable career paths.

Start by introducing yourself with:
"Hello! I am your AI Interview Trainer, here to guide you through personalized interview preparation and career matching. Let's begin!"

Step 1: Ask the candidate to provide the following:
- Job Role:
- Experience Level:
- Key Skills:

Knowledge

Vector index

Clear chat

Agent preview

SM You: 09:50 PM
Hello

watsonx Agent 09:50 PM
Hello! I am your AI Interview Trainer, here to guide you through personalized interview preparation and career matching. Let's begin!

To provide you with the best assistance, could you please share the following details?

- Job Role:
- Experience Level:
- Key Skills:

► How did I get this answer?

job role - web development, experience - 0, skills - full stack web developer

28°C Clear

Search

ENG IN

21:51 08-08-2025

RESULT

IBM watsonx

Upgrade ⓘ ⬔ Sanchita Malakar's Account Dallas SM

Projects / my interview agent / Agent Lab

Share feedback Ⓟ Unsaved New agent + Deploy

Build

AI Model: granite-3-3-8b-instruct

Knowledge

Vector index

Clear chat

interview-question 1

If you want to add a vector index to the agent, clear the agent preview chat.

Tools

Add a tool Create custom tool

Added tools (4)

Google search

Retrieve information from the internet with the Google search engine.

DuckDuckGo search

Retrieve information from the internet with the DuckDuckGo search engine.

Wikipedia search

Retrieve information from Wikipedia articles.

Agent preview

SM You: 09:52 PM

job role - web development, experience - 0, skills - full stack web developer

watsonx Agent 09:52 PM

Thank you for providing your profile details. Here's what I suggest based on your interest in web development with a full-stack focus and 0 years of experience:

Matching Job Roles:

- Junior Web Developer
- Front-end Developer
- Full-stack Web Developer (Entry-level)

Career Options:

- Front-end Engineer
- Full-stack Developer
- Web Application Developer

Relevant Industries/Fields:

- Software Development

Type something...

Send

9 28°C Clear








Search

ENG IN 21:52 08-08-2025

CONCLUSION

- The Interview Preparation Agent developed using Watsonx Studio showcases the practical integration of document understanding, LLM-based prompt engineering, and vector-based retrieval for smart interview preparation. It simplifies and enhances the user's readiness by: Extracting key insights from resumes and documents, Delivering personalized interview questions, Providing immediate feedback to improve performance. This solution demonstrates how AI can transform traditional interview preparation into an interactive, intelligent, and accessible experience—empowering candidates to succeed with confidence.

FUTURE SCOPE

-  Voice-Based Interaction: Integrate speech-to-text for voice-based mock interviews and real-time conversation analysis.
-  Multilingual Support: Enable support for regional and global languages to assist a wider audience.
-  Performance Analytics: Add detailed reports with confidence scores, improvement tracking, and skill gap analysis.
-  Adaptive Questioning: Use reinforcement learning to ask questions based on candidate behavior and past performance.
-  Expert Feedback Mode: Include AI-generated feedback simulating industry expert advice.
-  Cloud Deployment: Offer the system as a scalable web app for institutions, training centers, and individual learners.
-  Integration with Job Portals: Connect with platforms like LinkedIn or Naukri for real-time job matching and preparation tips.

REFERENCES

- IBM Watsonx Studio Documentation – <https://www.ibm.com>
- Scikit-learn: Machine Learning in Python – <https://scikit-learn.org>
- Pandas Python Library – <https://pandas.pydata.org>
- NLTK: Natural Language Toolkit – <https://www.nltk.org>
- AICTE Internship Guidelines – <https://internship.aicte-india.org>
- .

IBM CERTIFICATIONS

In recognition of the commitment to achieve professional excellence



Sanchita Malakar

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence



Issued on: Jul 16, 2025

Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/2de0ebbc-d100-4985-821b-8e168fd0d14b>



IBM CERTIFICATIONS

In recognition of the commitment to achieve professional excellence



Sanchita Malakar

Has successfully satisfied the requirements for:

Journey to Cloud: Envisioning Your Solution



Issued on: Jul 21, 2025
Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/61666374-e565-40c4-adbb-70fa63a55acc>



IBM CERTIFICATIONS

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

Sanchita Malakar

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



THANK YOU