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

INTERVIEW TRAINER AGENT

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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.

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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

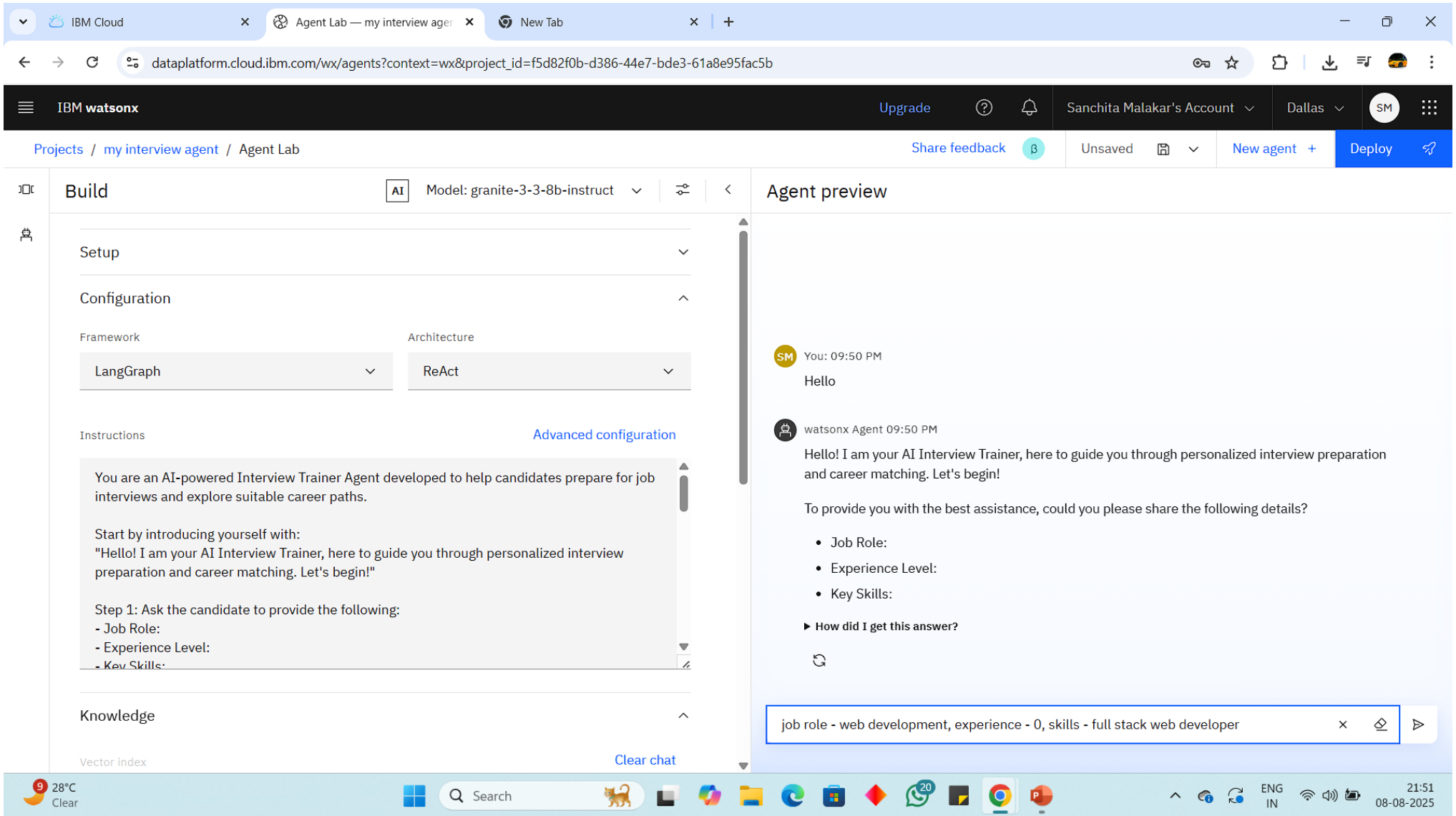
- **Algorithm Selection:**The project uses a retrieval-augmented generation (RAG) approach combined with foundation models (e.g., Granite, FLAN-T5) in Watsonx. These models are ideal for handling natural language queries and retrieving relevant answers from uploaded documents like resumes and interview 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



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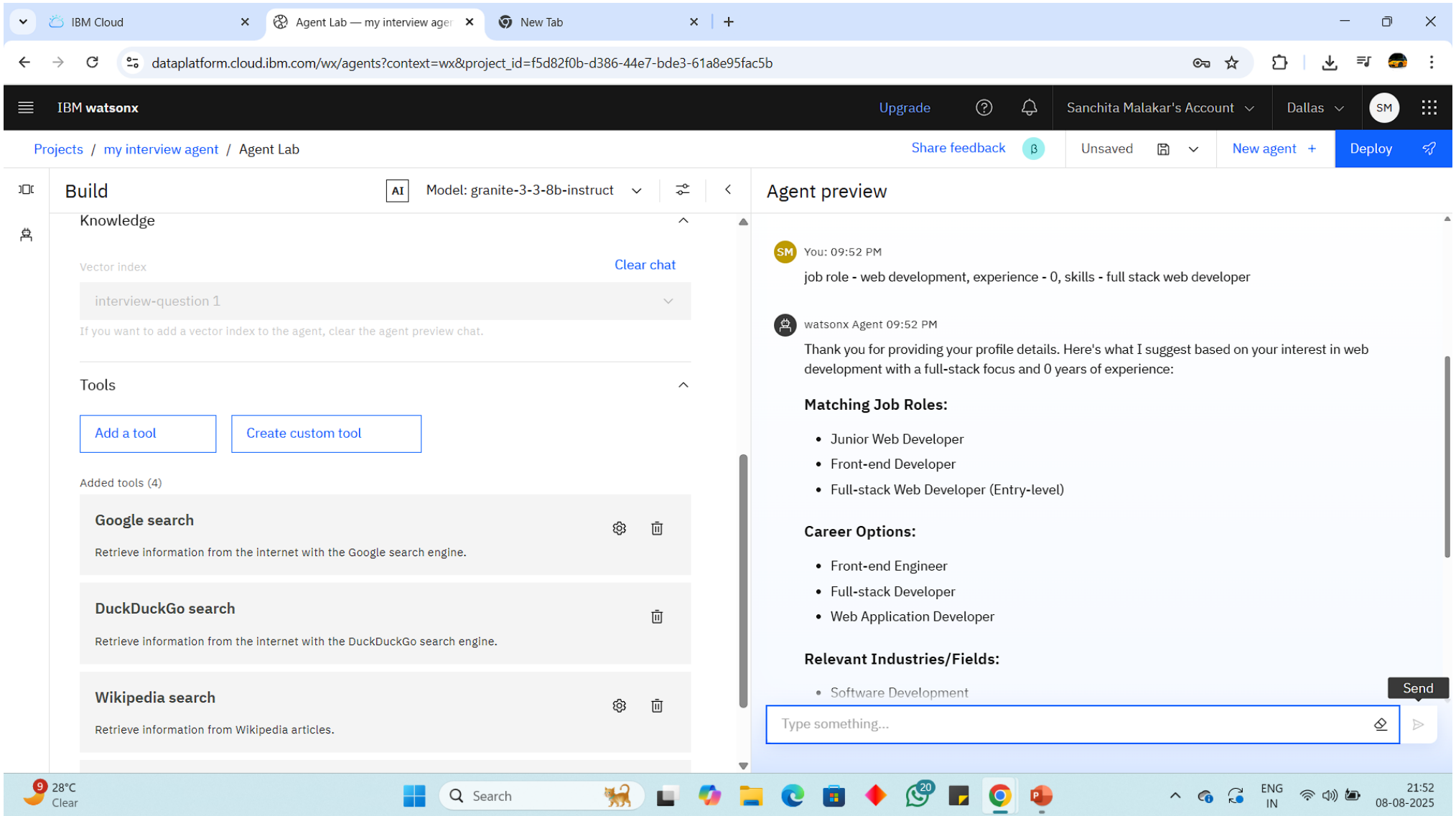
RESULT



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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
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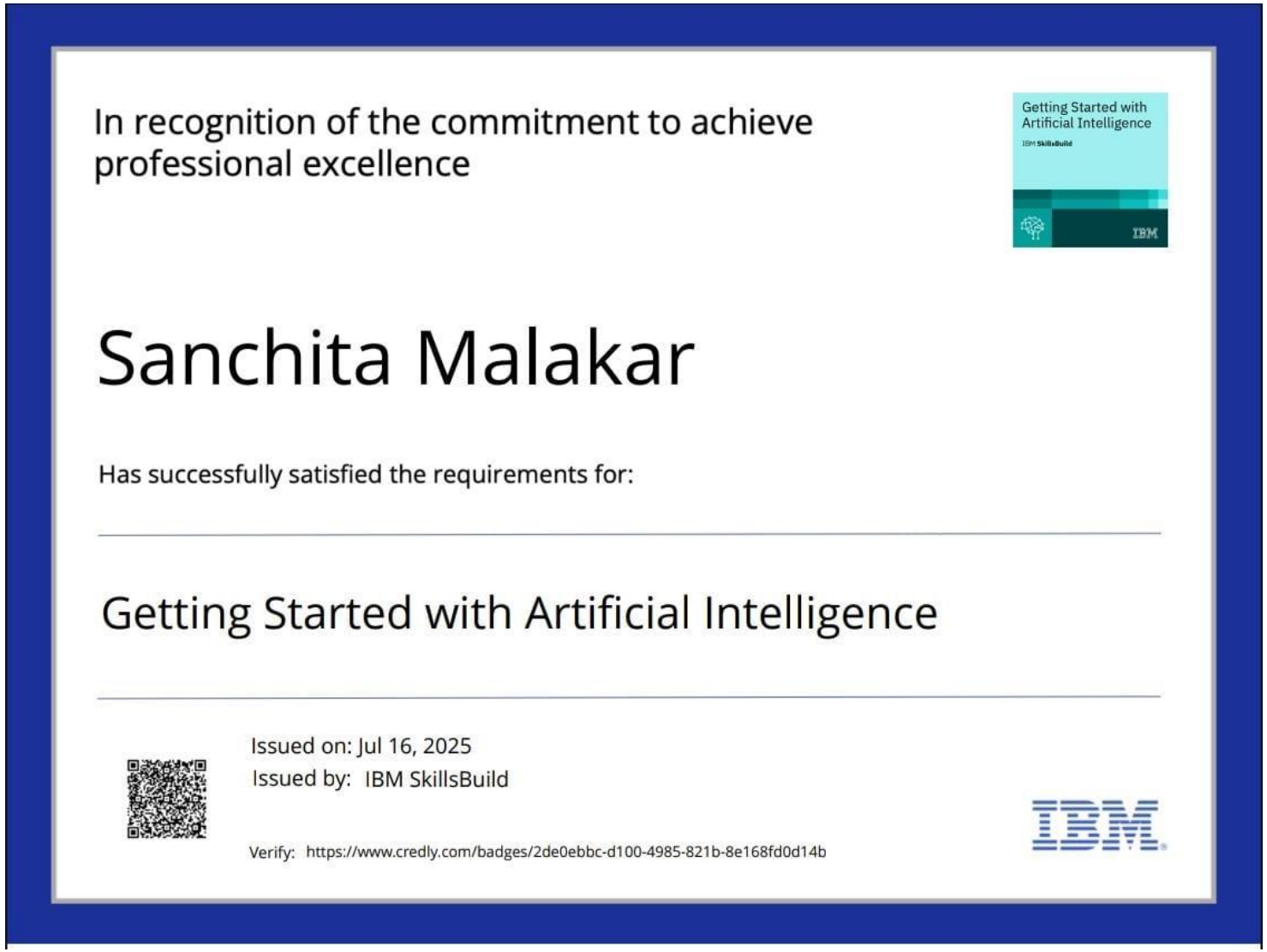

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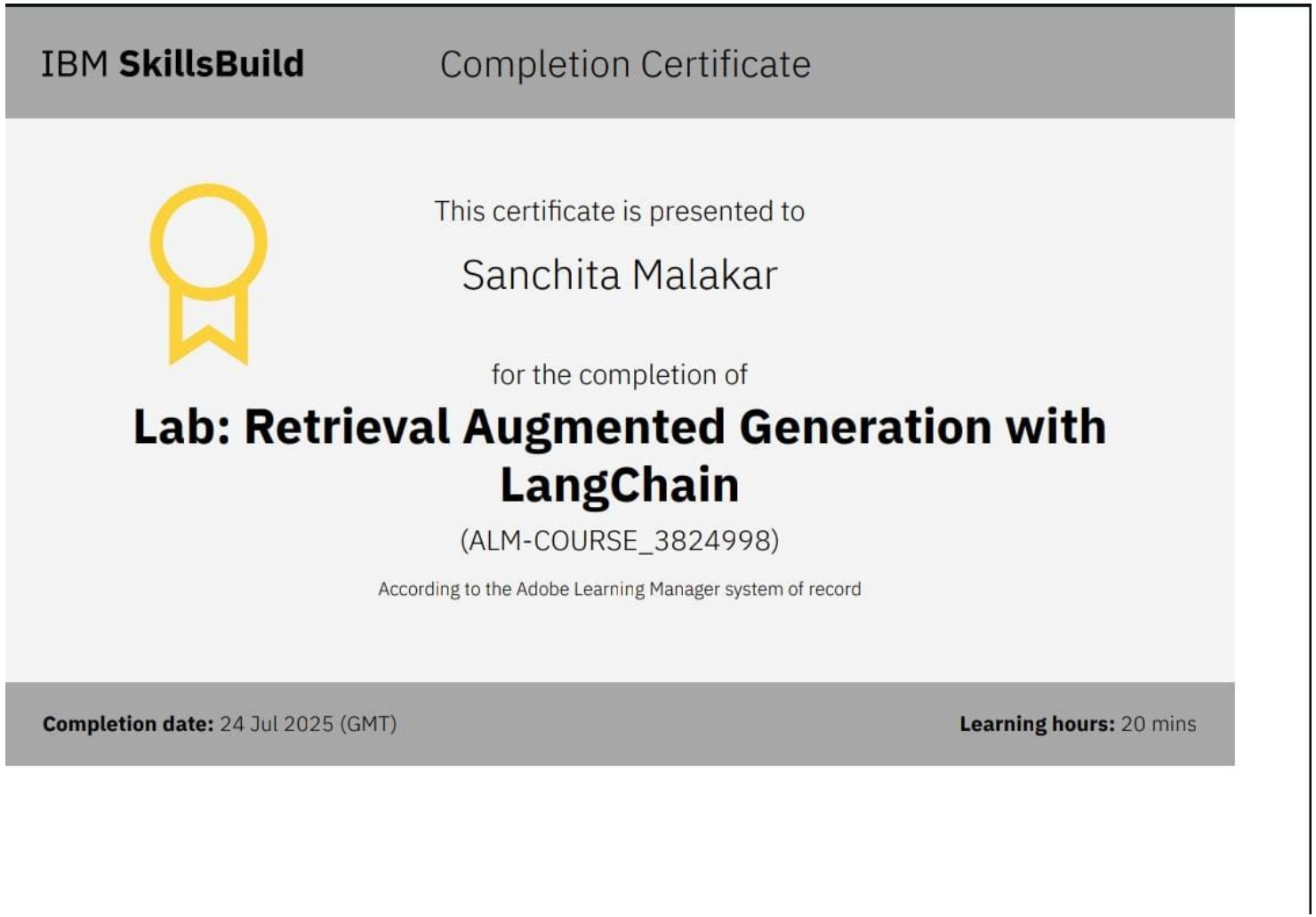

IBM **SkillsBuild** Completion Certificate

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THANK YOU

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