CAPSTONE PROJECT

AI AGENT FOR CHRONIC DISEASE MONITORING

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OUTLINE

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- System Development Approach
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PROBLEM STATEMENT

Chronic diseases such as diabetes, hypertension, and heart conditions require regular monitoring and timely interventions. Many patients struggle to manage their conditions due to lack of awareness, missed symptoms, or poor medication adherence. There is a pressing need for a personalized, accessible, and intelligent system to help patients and caregivers monitor health trends, detect early warning signs, and receive guided support—all without relying on physical devices.

PROPOSED SOLUTION

- The proposed solution is a cloud-based conversational AI agent that acts as a virtual health assistant. Through natural dialogue, it collects simulated patient data (e.g., age, blood pressure, glucose levels, symptoms) and provides:
    - Early risk alerts for chronic conditions
    - Lifestyle and medication suggestions
    - Personalized, interactive health advice
    - A knowledge-grounded system for trustworthy outputs
- This agent is designed to function without hardware, using IBM Watsonx and foundation models for intelligent interaction.

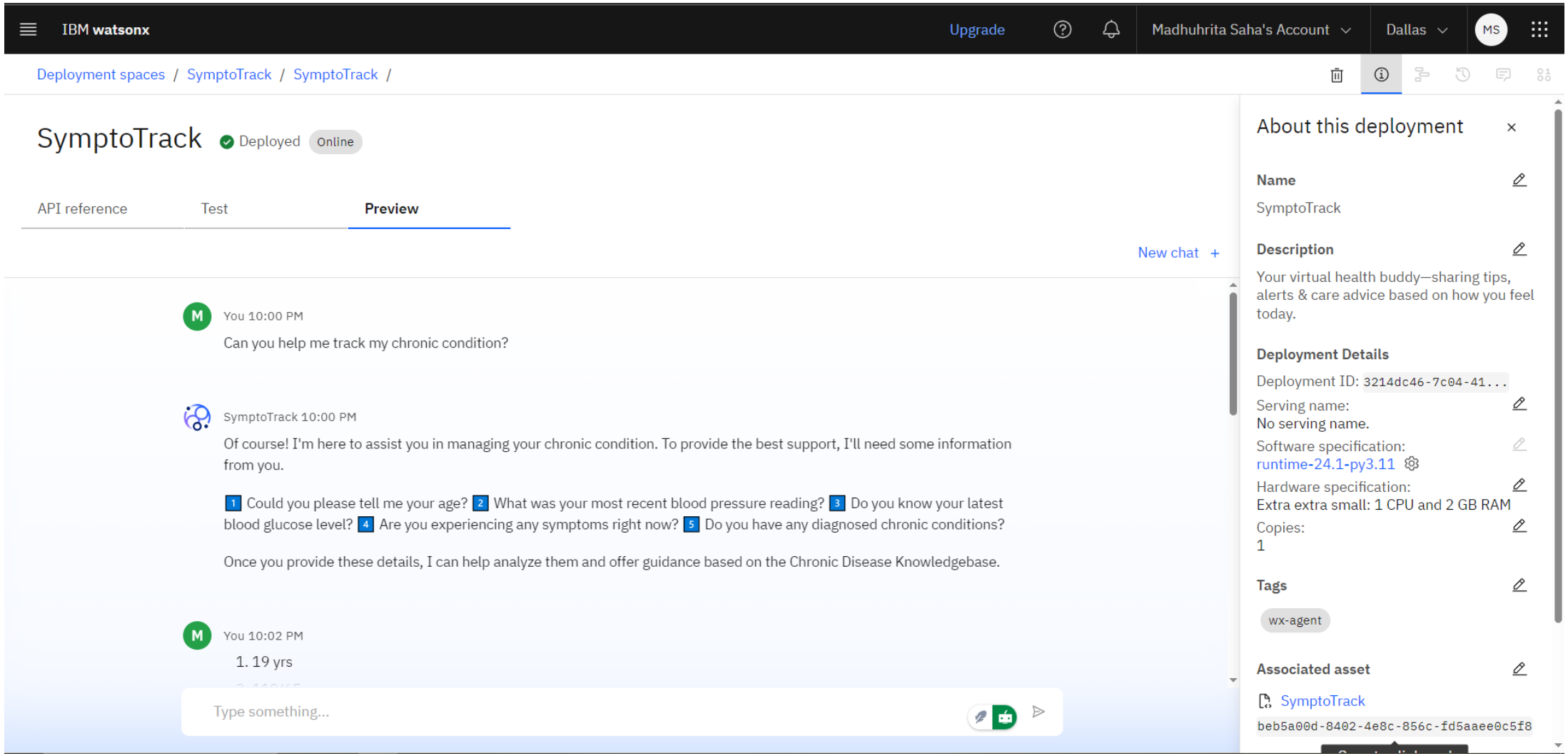
SYSTEM APPROACH

- **System Requirements:**
  - IBM Cloud Lite Account
  - Internet-enabled browser
  - Patient health data inputs (simulated)
- **Libraries/Resources Used:**
  - Watsonx.ai (for Agentic AI)
  - Granite/Mistral large language model
  - Vector Index (knowledge grounding)
  - Prompt engineering (healthcare-focused dialogues)
- **Knowledge Base:**
  - Uploaded documents on hypertension, diabetes, and heart disease management
  - Simple structured guidance on symptoms, ranges, and health tips

ALGORITHM & DEPLOYMENT

- **Model Used:**
  Foundation language model (IBM Granite or Mistral) deployed via Watsonx.ai
- **Input:**
  - Age
  - BP readings
  - Glucose level
  - Reported symptoms
- **Processing:**
  - Prompt-based reasoning with condition-specific logic
  - Retrieval-Augmented Generation using a vector index of healthcare knowledge
  - Grounded response generation for alerts and tips
- **Deployment:**
  - Agent created and deployed through Watsonx.ai
  - Integrated with a preview environment for simulation and testing
  - Available through conversational UI within IBM Cloud

RESULT



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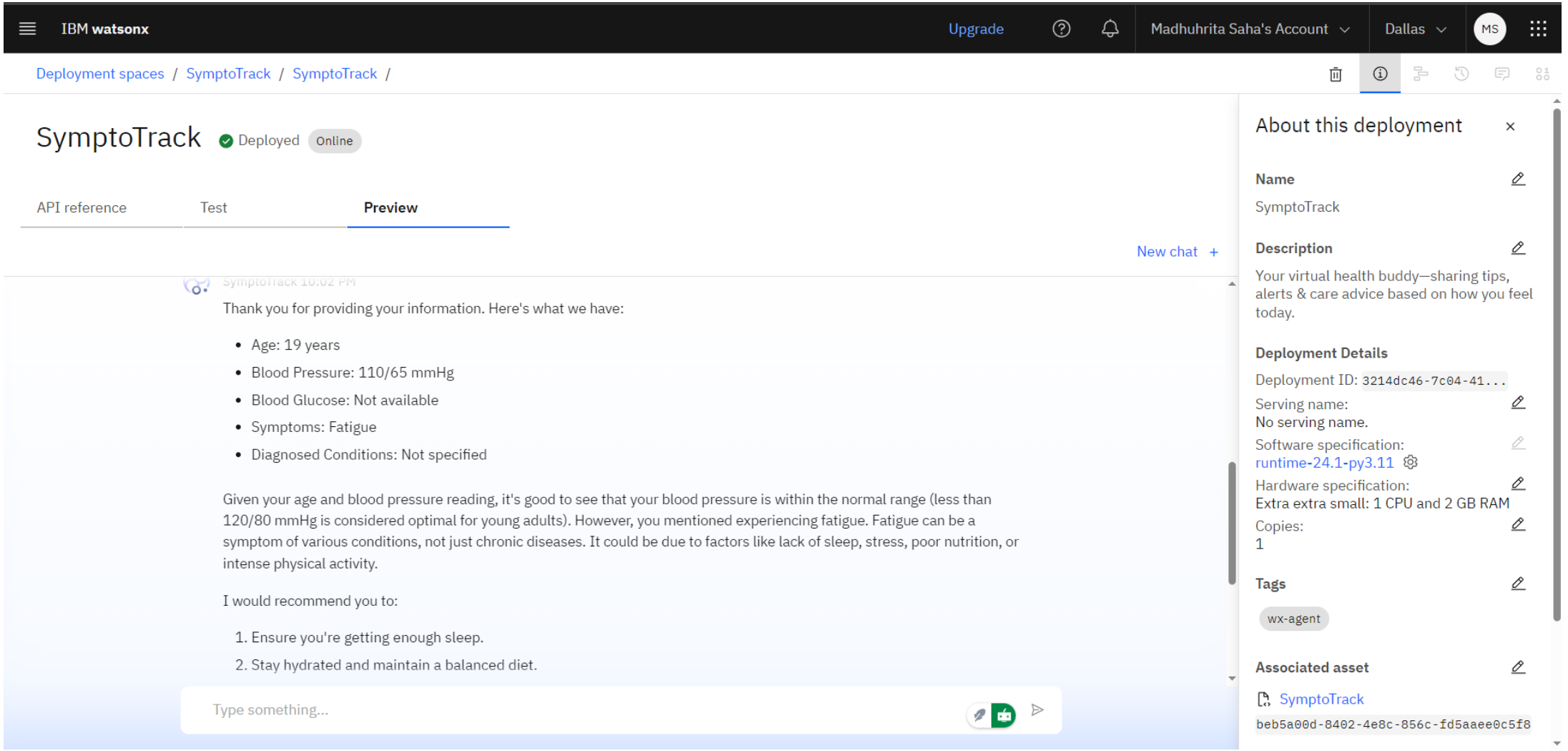
RESULT



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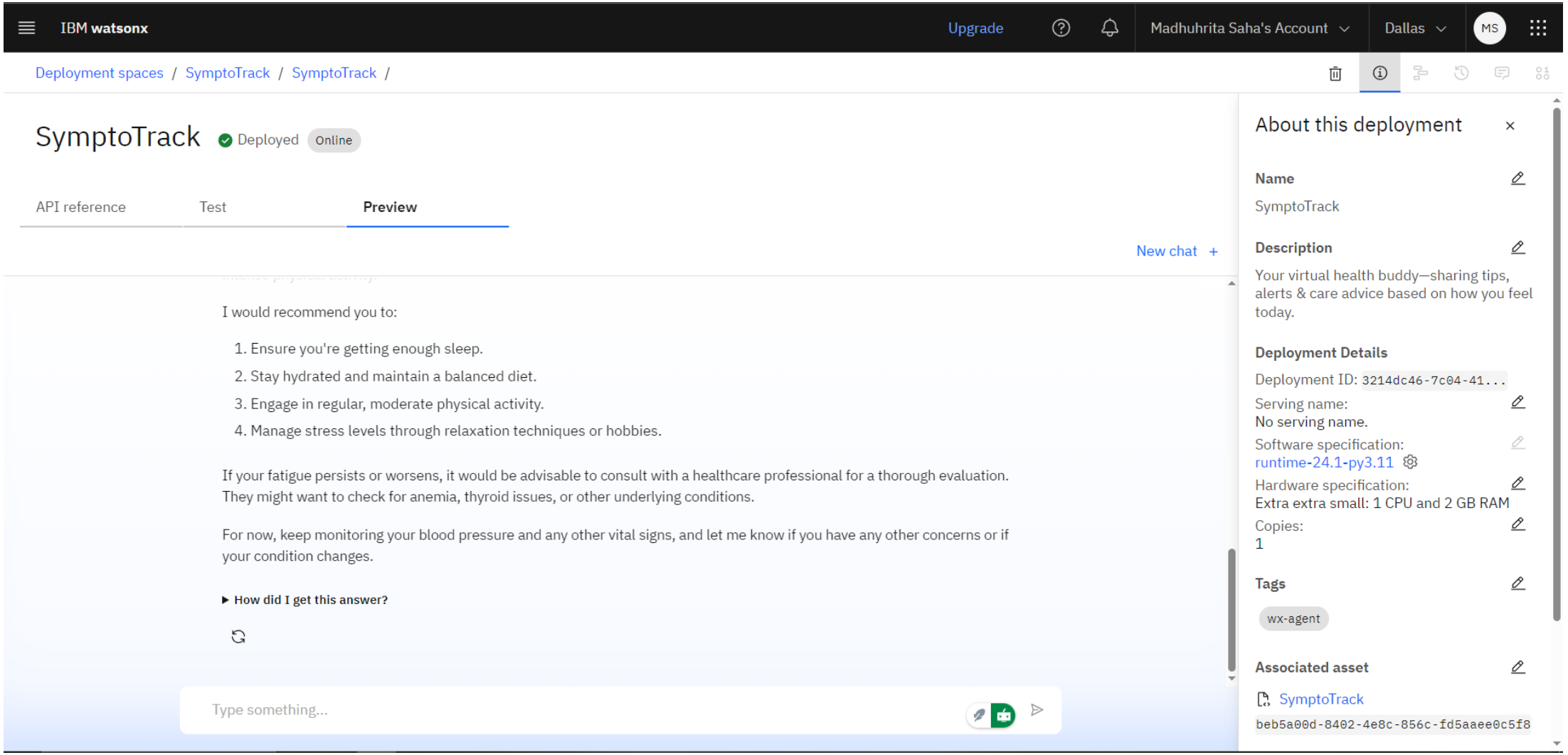
RESULT



CONCLUSION

The AI-based chronic disease monitoring chatbot successfully engages users, simulates health tracking, and provides grounded, helpful suggestions. Without the need for hardware, it showcases the potential of cloud-hosted LLMs in healthcare support. The system simplifies chronic care education, encourages proactive health habits, and enables users to seek help before emergencies arise.

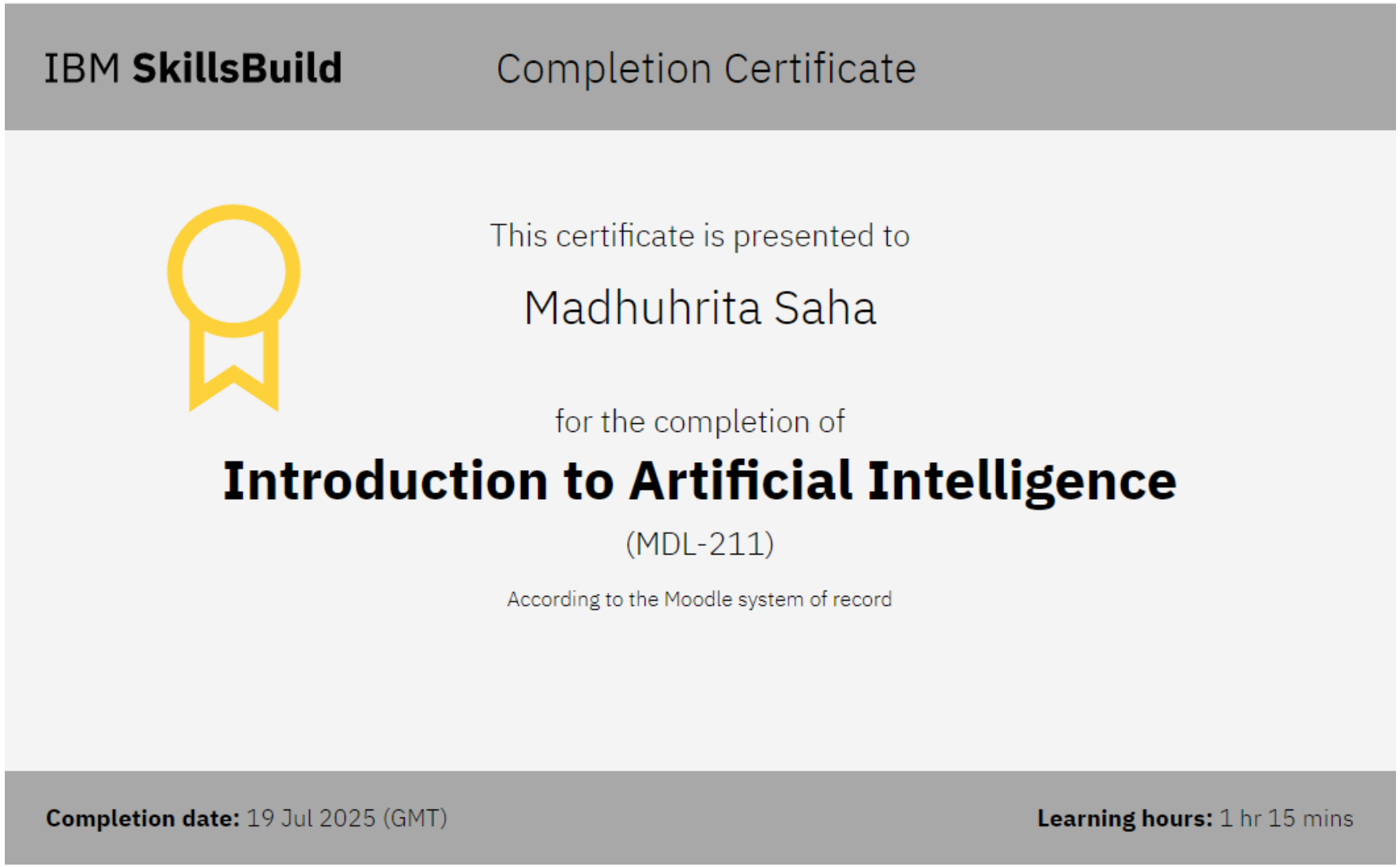
FUTURE SCOPE

- Expand dataset to support more diseases (e.g., asthma, COPD)
- Add multilingual support for accessibility
- Integrate voice assistant capability
- Build a web/app frontend for wider adoption
- Improve personalization with user profiles and longitudinal tracking
- Explore secure integration with EMR (Electronic Medical Records)

REFERENCES

- WHO: Chronic Disease Management Guidelines
- CDC.gov – Heart Disease & Diabetes Resources
- MedlinePlus & Mayo Clinic Patient Guides
- IBM Documentation on Watsonx.ai and Vector Index
- Project Knowledge Base (self-authored)
- Dataset: UCI & Kaggle (for testing prompts)

IBM CERTIFICATIONS



IBM **SkillsBuild** Completion Certificate

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Introduction to Artificial Intelligence

(MDL-211)

According to the Moodle system of record

Completion date: 19 Jul 2025 (GMT)

Learning hours: 1 hr 15 mins

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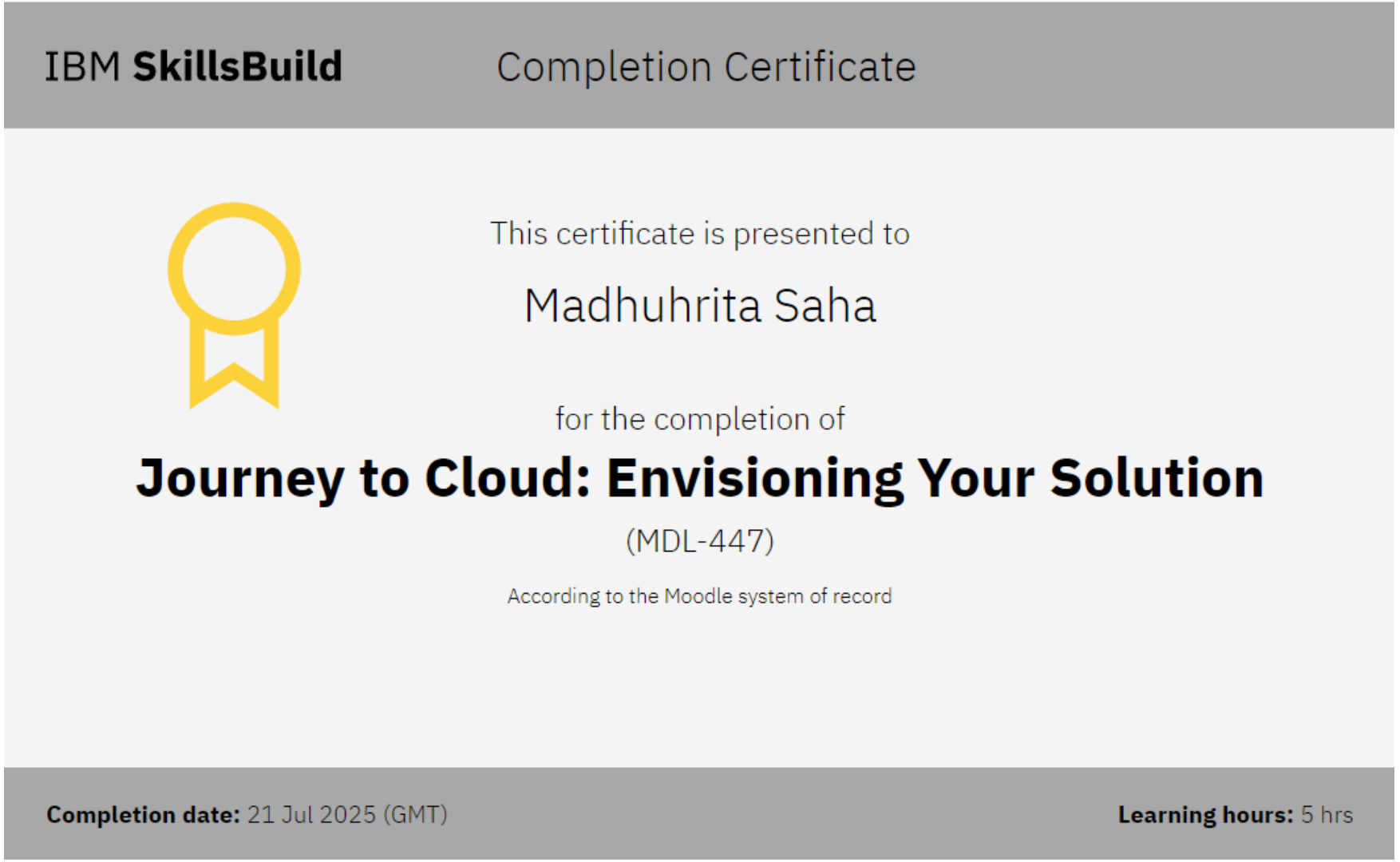

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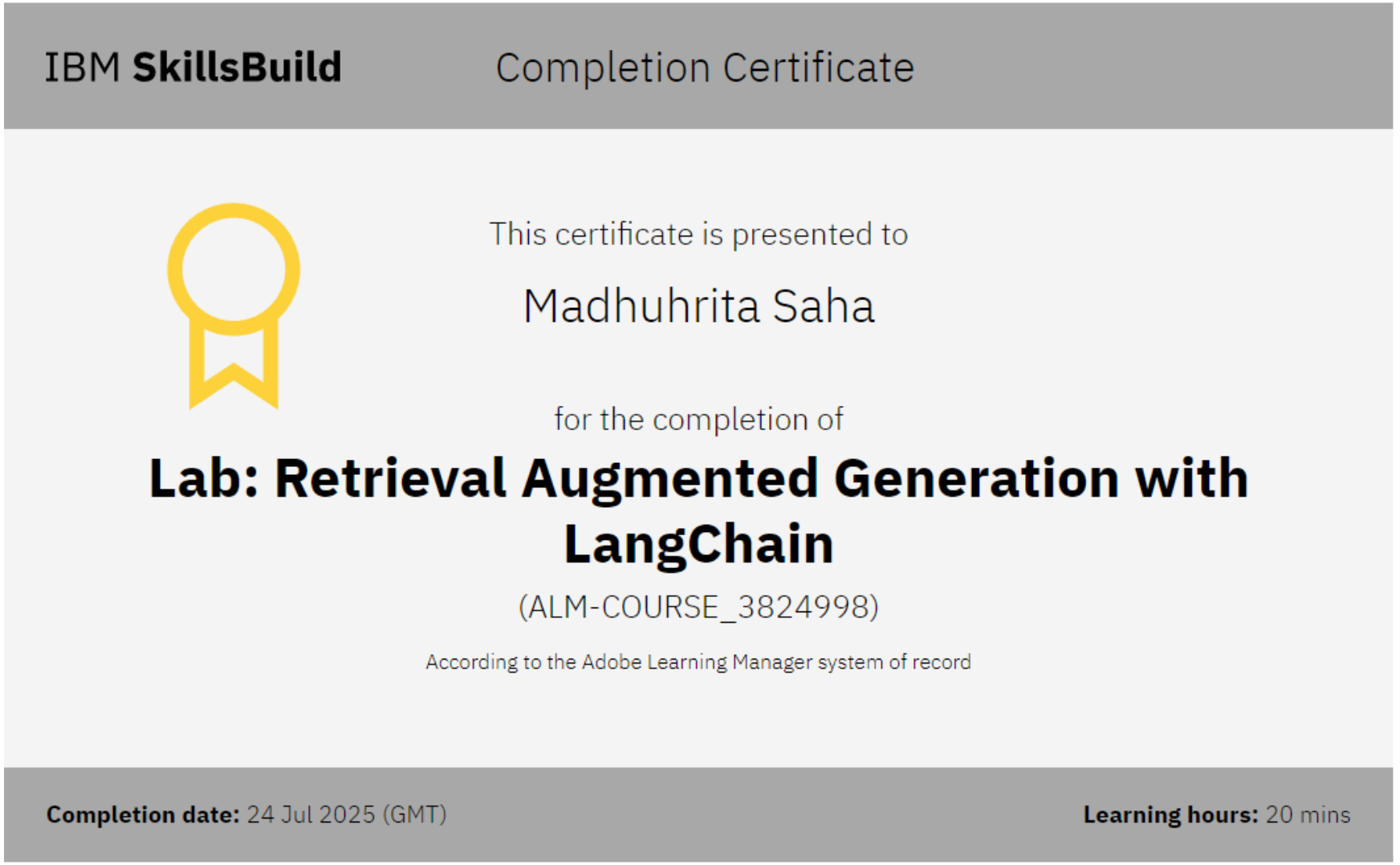

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THANK YOU

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