CAPSTONE PROJECT

WATSONFARM AI

Presented By:
1. MALLEDA VENKATESH – WELFARE INSTITUTION OF SCIENCE TECHNOLOGY AND MANAGEMENT

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PROBLEM STATEMENT

Small-scale farmers in India often lack access to timely, accurate, and localized agricultural information, such as suitable crops for the season, pest control measures, weather forecasts, and mandi prices. This information gap leads to uninformed decisions, reduced crop yield, and unstable income. There is a need for an accessible solution that can provide real-time, region-specific farming guidance in local languages.

PROPOSED SOLUTION

The proposed system,WatsonFarm AI, is an AI-powered farming assistant that uses IBM Watsonx Granite LLM and Retrieval-Augmented Generation (RAG) to deliver personalized agricultural advice. It enables farmers to ask queries in their native languages (e.g., Hindi, Telugu, Tamil) and get relevant, easy-to-understand responses. The system retrieves information from trusted sources such as government advisories, IMD weather data, crop guides, and mandi price APIs. It supports multi-language interaction, real-time data integration, and provides practical guidance for crop selection, pest control, soil treatment, and market awareness

SYSTEM APPROACH

- IBM Cloud Lite Services: Watsonx.ai, Watson Discovery, Language Translator

- IBM Granite Foundation Models: for natural language understanding and generation

- Watson Discovery: for document retrieval (RAG)

- Watson Language Translator: for multilingual interaction

- APIs: IMD Weather, Agmarknet Mandi Price APIs

- Backend: Python (Flask)

- Optional Frontend

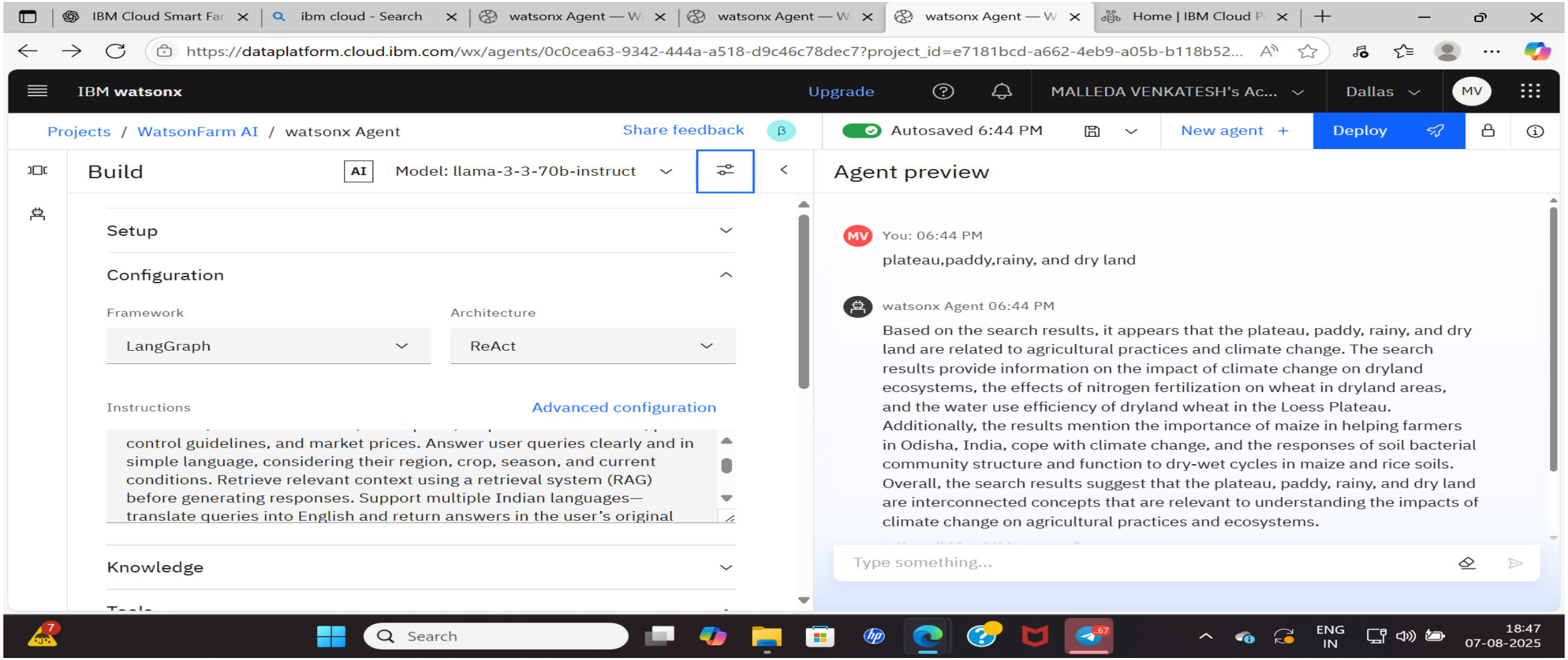
INSTRUCTION GIVEN TO AI AGENT

- You are an intelligent agricultural assistant designed to support small-scale farmers by providing accurate, timely, and localized farming advice. Use only trusted data sources such as government agricultural advisories, weather forecasts, soil reports, crop recommendations, pest control guidelines, and market prices. Answer user queries clearly and in simple language, considering their region, crop, season, and current conditions. Retrieve relevant context using a retrieval system (RAG) before generating responses. Support multiple Indian languages—translate queries into English and return answers in the user's original language using the Watson Language Translator. If real-time data like weather or mandi prices is requested, fetch it from live APIs and include the date and location in your response. If relevant data is not available, politely inform the user and suggest consulting the local agricultural office. Always avoid making assumptions or giving unsupported recommendations. Be accurate, concise, and farmer-friendly in every response.

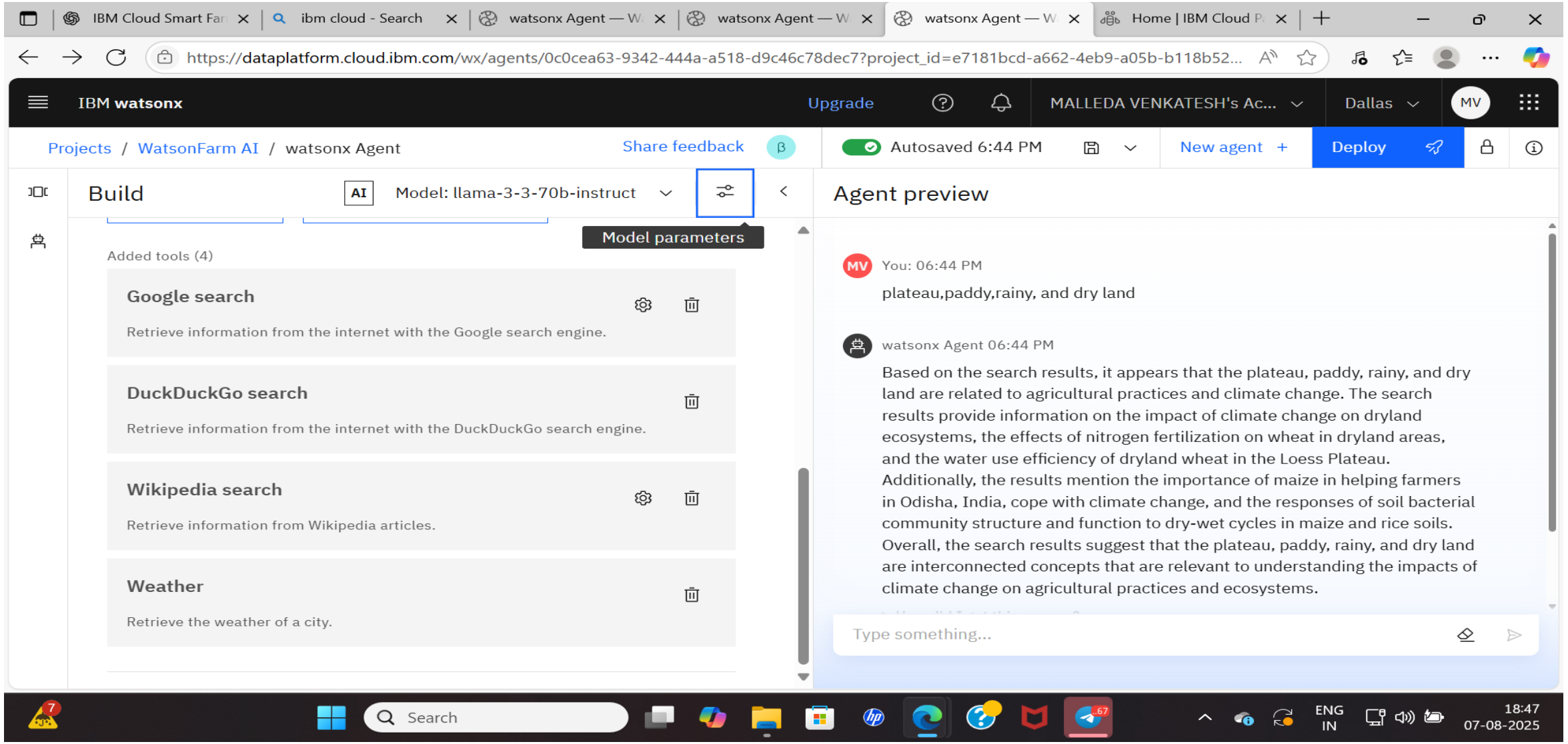
ALGORITHM & DEPLOYMENT

- - Retrieval-Augmented Generation (RAG): Combines document retrieval (Watson Discovery) with IBM Granite LLM for answer generation
- .- Language Translation: Watson Translator translates input/output to/from English and local languages.
- - Real-Time APIs: Integrated with IMD and Agmarknet APIs for live weather and price data
- .- Deployment: Hosted on IBM Cloud using Code Engine or Cloud Foundry, with scalable REST API endpoints

RESULT



RESULT



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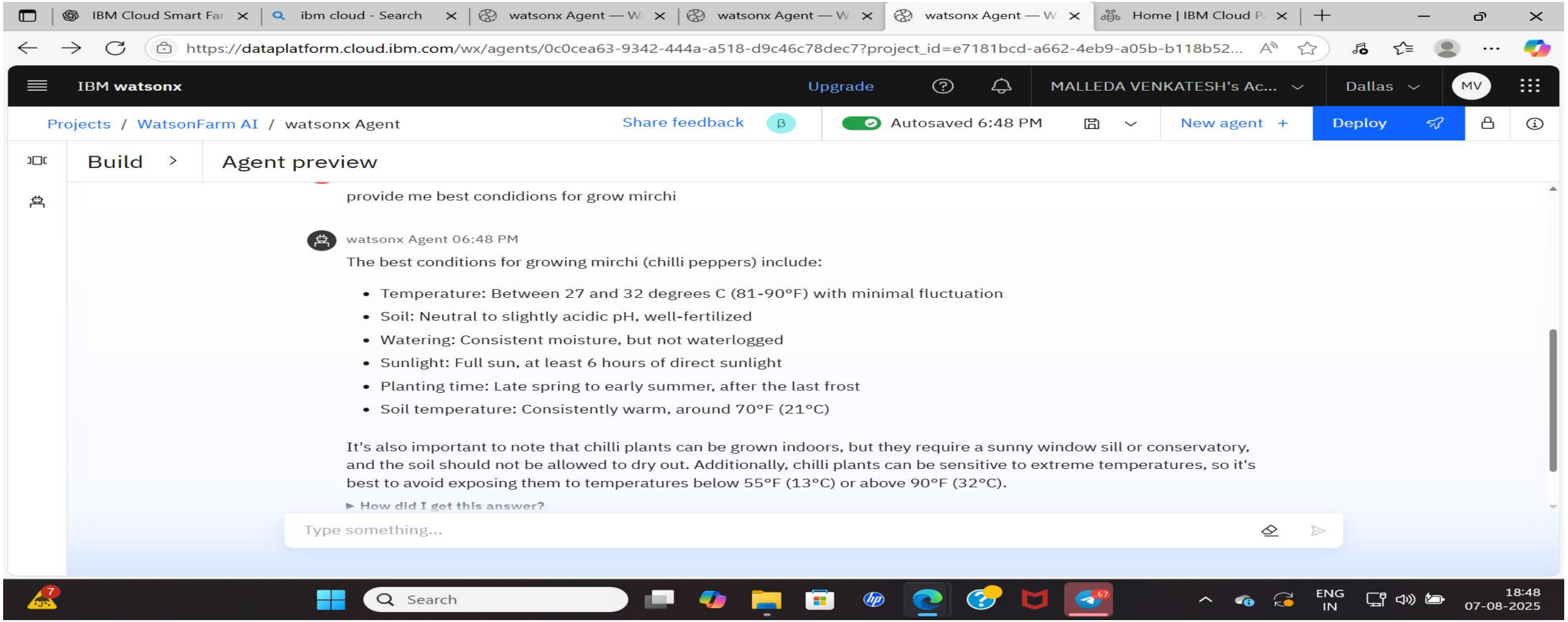
RESULT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Share feedback
Autosaved 6:48 PM
New agent +
Deploy
Build
Agent preview
provide me best condidions for grow mirchi
watsonx Agent 06:48 PM
The best conditions for growing mirchi (chilli peppers) include:
Temperature: Between 27 and 32 degrees C (81-90°F) with minimal fluctuation
Soil: Neutral to slightly acidic pH, well-fertilized
Watering: Consistent moisture, but not waterlogged
Sunlight: Full sun, at least 6 hours of direct sunlight
Planting time: Late spring to early summer, after the last frost
Soil temperature: Consistently warm, around 70°F (21°C)
It's also important to note that chilli plants can be grown indoors, but they require a sunny window sill or conservatory, and the soil should not be allowed to dry out. Additionally, chilli plants can be sensitive to extreme temperatures, so it's best to avoid exposing them to temperatures below 55°F (13°C) or above 90°F (32°C).
How did I get this answer?
Type something...
Search
ENG
IN
18:48
07-08-2025

CONCLUSION

- WatsonFarm AI successfully bridges the information gap in rural agriculture by delivering accurate and real-time farming guidance in the local language of the user. By integrating IBM's powerful AI tools and trusted data sources, the system enables better crop planning, pest control, and market awareness—leading to increased productivity and income for farmers.

FUTURE SCOPE

- - Add image-based crop disease detection using IBM Visual Recognition
- - Expand voice interface for IVR-based query handling
- - Integrate farmer profiles with history-based recommendations
- - Scale across multiple Indian states with dialect-specific support
- - Implement offline support with SMS-based queries

REFERENCES

- - IBM Watsonx & Granite Documentation
- - IMD API for weather data
- - Agmarknet API for mandi rates
- - ICAR Guidelines and Krishi Vigyan Kendra publications
- - Government Agri-Advisorie

IBM CERTIFICATIONS

IBM CERTIFICATIONS

In recognition of the commitment to achieve professional excellence

Journey to Cloud: Envisioning Your Solution

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Malleda Venkatesh

Has successfully satisfied the requirements for:

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Issued on: Jul 24, 2025
Issued by: IBM SkillsBuild

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IBM **SkillsBuild** Completion Certificate

This certificate is presented to

Malleda Venkatesh

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

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