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IBM SkillsBuild AI & Cloud Internship Project



## SMART FARMING ADVICE AGENT

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## OUTLINE

- Problem Statement
- Technologies Used
- IBM Cloud Services
- Wow factors
- End users
- Results
- Conclusion
- Git-hub Link
- Future scope
- IBM Certifications

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# PROBLEM STATEMENT

## Problem:

Small-scale farmers often lack access to:

-  Real-time crop and weather insights
-  Current market prices (mandi rates)
-  Localized pest control methods
-  Guidance in their local language

This leads to low yield, income instability, and higher risk.

## Proposed Solution:

An AI Agent built with RAG (Retrieval-Augmented Generation) and IBM Cloud tools, which provides personalized, localized farming support in regional languages.

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# TECHNOLOGY USED

-  LangGraph – Agent flow orchestration
-  Retrieval-Augmented Generation (RAG)
-  Vector Database – Stores and retrieves trusted agri documents
-  Large Language Models (LLMs) – Natural conversation interface
-  FastAPI – Optional backend interface

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## IBM CLOUD SERVICES USED

- • IBM Watsonx.ai Studio – Prompt management & LLM integration
- • IBM Watsonx Runtime – Model deployment
- • IBM Cloud Agent Lab – Development and testing
- • IBM Granite Foundation Models – Smart and safe responses
- • IBM Cloud Object Storage – Secure knowledge storage

# WOW FACTORS

- Domain-specific: Answers only farming-related queries
- Filters out irrelevant topics like celebrities or politics
- Falls back to trusted web sources if DB lacks info
- Supports local languages (e.g., Telugu)
- Clear, simple, farmer-friendly responses

## Example Interactions:

**1** Q: What is the tomato price in Nizamabad today?

A: ₹950 per quintal (from vector DB document, dated 2025-08-01)

**2** Q: Who is Shah Rukh Khan?

A: I'm designed to assist with farming-related advice and information only. Please ask something related to agriculture.

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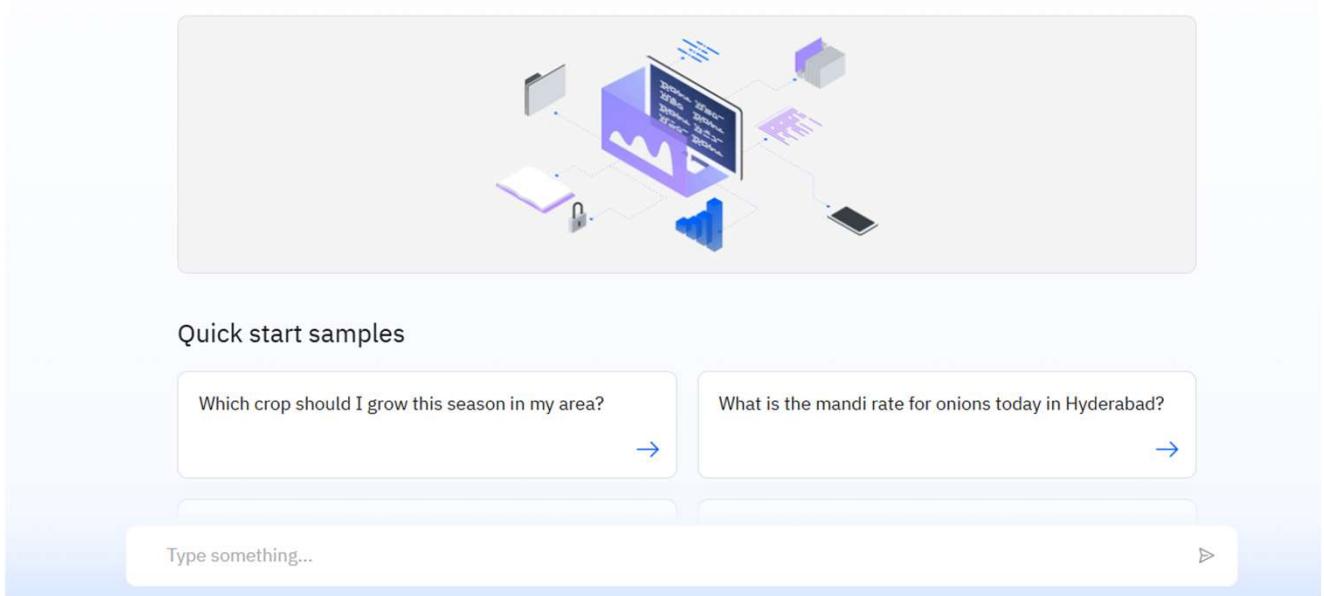
## END USERS

-  Small and marginal farmers
-  Agri officers and NGOs
-  AgriTech startups
-  Government agencies

# RESULTS

## Agent Setup Preview

- **Agent Name:** Smart Farming Assistance Agent
- **Description:** Smart AI agent offering real-time, local farming advice using RAG for small-scale farmers
-  Icon and illustrative placeholder image selected to reflect AI + Agriculture



The image shows a digital interface for the "Smart Farming Assistance Agent". At the top, there is a header with a profile icon, the text "Smart Farming Assistance Agent 06:44 PM", and a welcome message: "Welcome to Smart Farming Assistance Agent". Below the header, a subtext states: "Smart AI agent offering real-time, local farming advice using RAG for small-scale farmers." A central graphic features a purple smartphone displaying a weather forecast with temperatures like 24°C, 25°C, 26°C, 27°C, 28°C, and 29°C. Surrounding the phone are icons representing a folder, a lock, a bar chart, a speaker, and a gear. Below this graphic, the text "Quick start samples" is displayed. Two sample questions are shown in boxes with right-pointing arrows: "Which crop should I grow this season in my area?" and "What is the mandi rate for onions today in Hyderabad?". At the bottom, there is a search bar with the placeholder text "Type something..." and a right-pointing arrow.

# RESULTS

## Live Chat Interaction Snapshots

**Q1: How can I protect my paddy crop from pests right now?**

Response:

- Suggested **biological control**: Trichogramma japonicum
- Mentioned **chemical options**: Chlorantraniliprole, Imidacloprid
- Recommended **eco-friendly practices**: sticky traps, neem-based pesticides
- Emphasis on **good soil and irrigation health**

 You 06:44 PM  
How can I protect my paddy crop from pests right now?

 Smart Farming Assistance Agent 06:44 PM  
To protect your paddy crop from pests, you can use Trichogramma japonicum or Chlorantraniliprole (0.4 ml/litre) to control stem borers, and neem-based bio-pesticides to control leaf folders. Additionally, you can use yellow sticky traps and Imidacloprid (0.3 ml/litre) to control whiteflies. It's also important to maintain good soil health and irrigation practices to prevent pest infestations.

 You 06:45 PM  
What is the mandi rate for onions today in Hyderabad?

 Smart Farming Assistance Agent 06:45 PM  
The current mandi rate for onions in Hyderabad is ₹12.4/kg.

► How did I get this answer?



Type something... 

# RESULTS

**Q2: What is the mandi rate for onions today in Hyderabad?**

 Response:

- Provided **real-time market rate: ₹12.4/kg**
- Response retrieved based on **available vector DB or trusted web fallback**

 You 06:44 PM

How can I protect my paddy crop from pests right now?

 Smart Farming Assistance Agent 06:44 PM

To protect your paddy crop from pests, you can use Trichogramma japonicum or Chlorantraniliprole (0.4 ml/litre) to control stem borers, and neem-based bio-pesticides to control leaf folders. Additionally, you can use yellow sticky traps and Imidacloprid (0.3 ml/litre) to control whiteflies. It's also important to maintain good soil health and irrigation practices to prevent pest infestations.

 You 06:45 PM

What is the mandi rate for onions today in Hyderabad?

 Smart Farming Assistance Agent 06:45 PM

The current mandi rate for onions in Hyderabad is ₹12.4/kg.

► How did I get this answer?



Type something... 

# RESULTS

## Deployed AI Agent

Smart Farming Assistance Agent ● Deployed online

API reference   Test   Preview   Nr.

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 Smart Farming Assistance Agent 06:44 PM

**Welcome to Smart Farming Assistance Agent**

Smart AI agent offering real-time, local farming advice using RAG for small-scale farmers.



Quick start samples

Which crop should I grow this season in my area?

What is the mandi rate for onions today in Hyderabad?

Type something... »

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## CONCLUSION

- Brings reliable agri knowledge to farmers
- Combines AI + documents + web info
- Avoids hallucination with strong fallback logic
- Makes farming smarter, accessible, and safer

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## GITHUB LINK

 GitHub Repo:

[https://github.com/Chiranjeevisai18/Smart\\_Farming\\_Assistance\\_Agent.git](https://github.com/Chiranjeevisai18/Smart_Farming_Assistance_Agent.git)

Contains:

- Agent flow code
- Sample vector documents
- Query templates
- API setup guide

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## FUTURE SCOPE

-  Voice assistant for farmers
-  Mobile app with offline mode
-  Live weather + market APIs
-  Image-based pest diagnosis
-  Support more regional languages

## IBM CERTIFICATIONS

In recognition of the commitment to achieve professional excellence



# Chiranjeevi Sai Moka

Has successfully satisfied the requirements for:

## Getting Started with Artificial Intelligence

Issued on: Jul 19, 2025

Issued by: IBM SkillsBuild



Verify: <https://www.credly.com/badges/c393a1ad-e67b-41aa-b35f-992b10cbe164>





## Completion Certificate



This certificate is presented to  
Chiranjeevi Sai Moka

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**