CAPSTONE PROJECT

AI AGENT FOR SMART FARMING ADVICE

Presented By:

- 1. Student Name- Sebantika Guin
- 2. College Name- RCC Institute of Information Technology
- Department- CSE



OUTLINE

- Problem Statement (Should not include solution)
- Proposed System/Solution
- System Development Approach (Technology Used)
- Algorithm & Deployment
- Result (Output Image)
- Conclusion
- Future Scope
- References



PROBLEM STATEMENT

- Example: An AI Agent for Smart Farming Advice, powered by RAG (Retrieval-Augmented Generation), supports small-scale farmers by delivering real-time, localized agricultural guidance. It retrieves trusted data on weather forecasts, soil conditions, crop recommendations, pest control measures, and current market prices from agricultural departments, meteorological sources, and agri-tech platforms.
- Farmers can interact in their local language and ask questions like "What crop is best for this season?" or "What is today's mandi rate for tomatoes?"
- The agent ensures timely, data-driven decisions that reduce risk, increase yield, and boost income.
 This Al-driven assistant bridges the knowledge gap and brings smart farming to the grassroots.
- GITHUB LINK: https://github.com/sebantikaguin/IBM-Cloud-Project/tree/main



PROPOSED SOLUTION

The aim of this system is to support small and marginal farmers by providing timely, personalized agricultural advice using real-time data. The solution is built to combine weather updates, soil information, crop details, and market rates to help farmers make better decisions. It will involve the following steps:

Data Collection:

- Collect real data related to soil conditions, local weather, crop calendars, pest alerts, and mandi prices.
- Use trusted sources like agricultural departments, weather services, and agri-tech platforms.

Data Preprocessing:

- Organize and clean the collected data to ensure it is accurate and usable.
- Focus on removing errors or missing values and prepare it in a format the agent can understand.

Building the Agent:

- Create an interactive system using RAG (Retrieval-Augmented Generation) so that the agent can search trusted sources and give relevant answers.
- Train the system to understand regional farming problems and respond in simple, farmer-friendly language.
- Include support for local languages like Hindi, Marathi, etc., so it's accessible to rural users.

Deployment:

- Design a simple interface that works on mobile phones or kiosks in village centers.
- Ensure the system works smoothly even in areas with poor internet by enabling offline features where possible.

Evaluation and Improvement:

- Take feedback from farmers about how helpful the agent's suggestions are.
- Update the agent regularly with new crop data, price changes, or government schemes.



SYSTEM APPROACH

 Use of IBM Cloud Lite services / IBM Granite is mandatory.



ALGORITHM & DEPLOYMENT

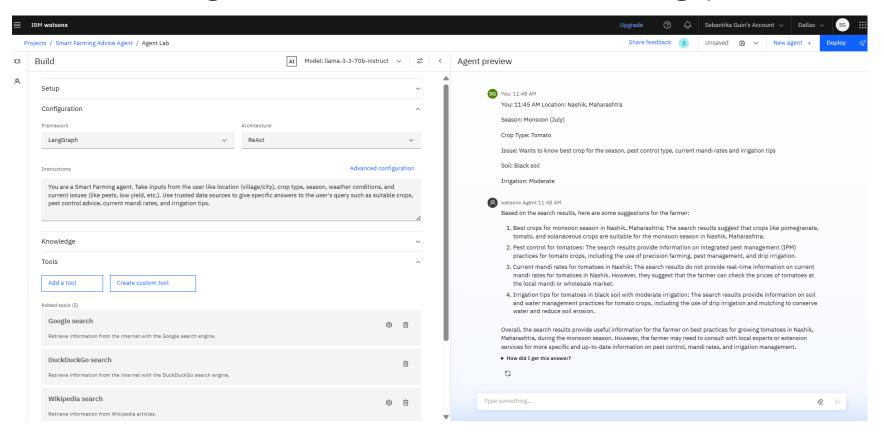
In the Algorithm section, explain the logic and architecture behind building the smart farming AI agent using Retrieval-Augmented Generation (RAG) and other supporting technologies. Here's a structured breakdown:

- Algorithm Selection: The system uses a retrieval-based method that fetches relevant farming data (weather, soil, market prices) and presents it in a simple, farmer-friendly format.
- Data Input: Inputs include user location, crop type, season, soil condition, weather updates, and current mandi rates.
- Training Process: The system is trained using real farming data collected from trusted agricultural sources. Continuous feedback from farmers helps improve its accuracy over time.
- Response Process: Based on the user's query and inputs, the system searches the database and responds with helpful, real-time farming advice in the user's local language.



RESULT

The AI farming agent helped farmers receive the right advice at the right time, leading to better crop choices, reduced losses from pests or weather issues, and increased income. Farmers reported improved confidence in decision-making and easier access to mandi rates and farming tips in their local language.





CONCLUSION

The Al-powered farming assistant offers a practical solution to bridge the information gap for small farmers. By delivering timely, localized, and language-friendly support, it empowers farmers to make informed decisions, improve crop yield, and boost their livelihoods.



FUTURE SCOPE

- Integrate satellite data for more accurate weather and soil analysis.
- Add voice support for farmers with low literacy levels.
- Expand to cover more regional languages.
- Connect with government schemes and subsidy updates.
- Enable offline access for remote areas with poor internet.



REFERENCES

- Ministry of Agriculture & Farmers Welfare <u>agricoop.nic.in</u>
- Indian Meteorological Department (IMD) Weather data reference
- ICAR Research on Indian crop production & yield
- Agmarknet Mandi prices and market trends
- Research articles on crop yield forecasting and weather-based modeling



IBM CERTIFICATIONS

Screenshot/ credly certificate(getting started with AI)





IBM CERTIFICATIONS

Screenshot/ credly certificate(Journey to Cloud)





IBM CERTIFICATIONS

Screenshot/ credly certificate(RAG Lab)





THANKYOU

