
CAPSTONE PROJECT

RECIPE PREPARATION AGENT

Presented By:

1. SELVADHARSHINI S-Vellalar College For Women-MCA



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

The Challenge - A Recipe Preparation Agent helps users cook meals using only the ingredients they have on hand. By inputting available groceries, users receive tailored recipe suggestions using a RAG-based AI system. The agent retrieves relevant recipes and generates step-by-step instructions adapted to ingredient limitations. It offers substitutions, cooking tips, and dietary adjustments based on user preferences or restrictions. Designed to reduce food waste and save time, it turns pantry items into practical meal solutions. This AI assistant makes everyday cooking smarter, simpler, and more sustainable.



PROPOSED SOLUTION

- The proposed system is a Recipe Preparation Agent that interacts with users via chat and helps them cook meals using only the ingredients they have.
- The AI agent uses IBM's Watsonx with Granite models and a Retrieval-Augmented Generation (RAG) approach to:
- Understand user inputs (ingredients):
 - It understands user inputs such as available ingredients.
- Retrieve suitable recipes:
 - It retrieves suitable recipes from a predefined dataset or API.
- Generate clear, step-by-step instructions:
 - It generates clear, step-by-step cooking instructions.
- Offer ingredient substitutions and dietary advice:
 - It offers ingredient substitutions and dietary suggestions.



SYSTEM APPROACH

The "System Approach" section outlines the overall strategy and methodology for developing and implementing the Recipe Preparation Agent.

- Platform: IBM Cloud Lite
- Model: IBM Granite (LLM) – Mistral -large
- Framework: Watsonx Agent Builder
- Architecture: LangGraph with ReAct
- Data: Static Recipe Dataset (RAG)
- Mode: Chat-based interaction



PROJECT CREATION & MODEL CHOOSING

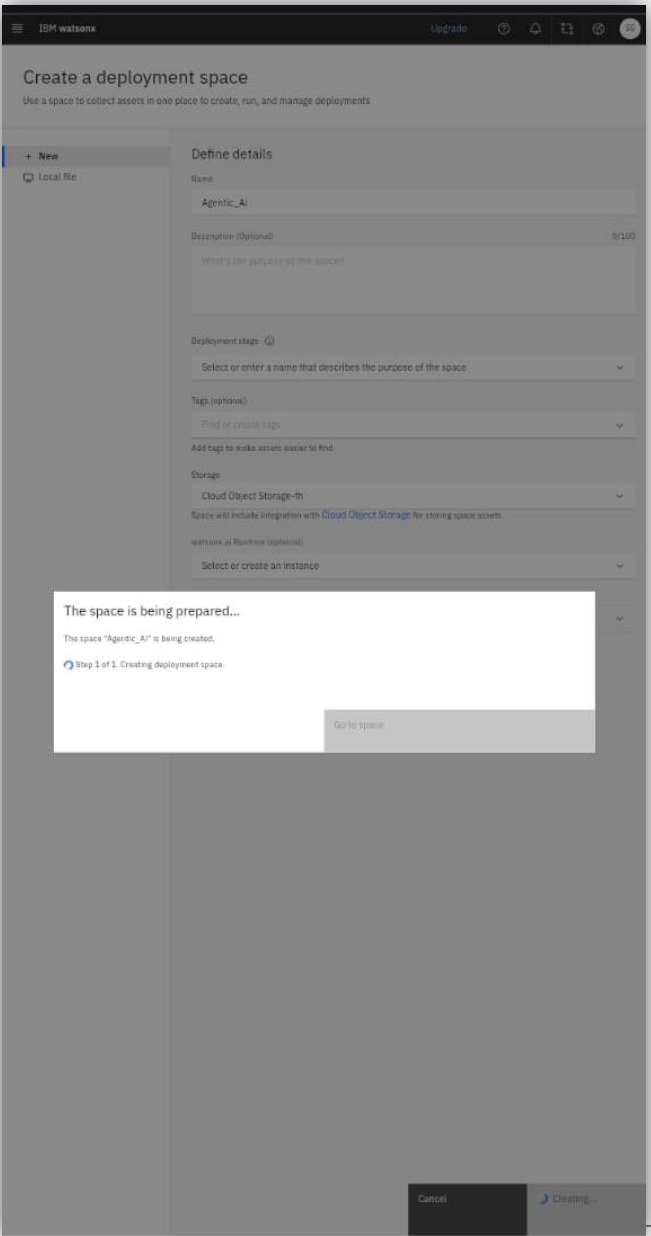
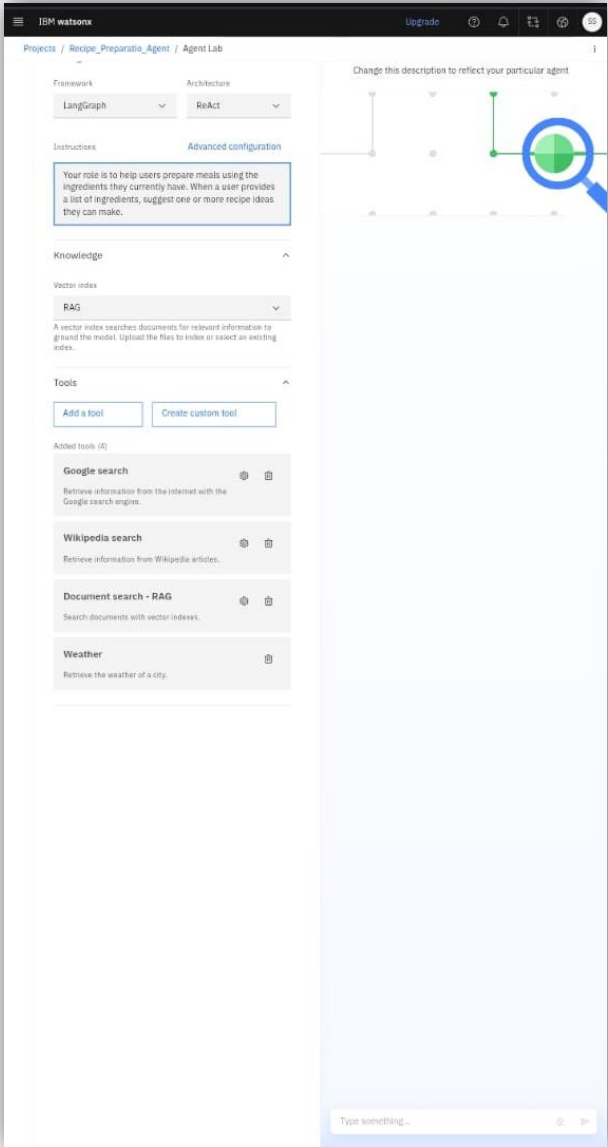
The screenshot shows the 'Create a project' page in the IBM watsonx interface. The page has a dark header with the 'IBM watsonx' logo and navigation icons. The main content area is titled 'Create a project' with a subtitle 'Start with a new, blank project or select from where to import an existing project.' On the left, there is a sidebar with a 'New' button and options for 'Local file' and 'Sample'. The main form is titled 'Define details' and includes fields for 'Name' (set to 'Recipe_Preparation_Agent'), 'Description (optional)' (set to 'approach. It helps reduce food waste and makes cooking simple and smart.'), 'Tags (optional)' (with an 'Add tags' button), 'Storage' (set to 'Cloud Object Storage-1h'), and 'Advanced settings' (with a dropdown arrow). At the bottom right, there are 'Cancel' and 'Create' buttons.

The screenshot shows the 'Agent preview' page in the IBM watsonx interface. The page has a dark header with the 'IBM watsonx' logo and navigation icons. The main content area is titled 'Agent preview' and includes a 'Setup' section with 'Framework' (set to 'LangGraph') and 'Architecture' (set to 'ReAct'). Below this is the 'Instructions' section, which contains a text box with the instruction: 'You are a helpful assistant that uses tools to answer questions in detail. When greeted, say "Hi, I am watsonx.ai agent. How can I help you?"'. There is also an 'Advanced configuration' link. The 'Knowledge' section is empty. The 'Tools' section has buttons for 'Add a tool' and 'Create custom tool'. Below this, there are three tool cards: 'Google search' (Retrieve information from the internet with the Google search engine), 'Wikipedia search' (Retrieve information from Wikipedia articles), and 'Weather' (Retrieve the weather of a city). On the right, there is a 'watsonx Agent 10:48 PM' chat window with a 'Welcome to watsonx Agent' message and a 'Change this description to reflect your particular agent' link. A blue magnifying glass icon is overlaid on the chat window.

ALGORITHM & DEPLOYMENT

- Algorithm: Retrieval-Augmented Generation (RAG)
- Input: User-provided ingredients (e.g., “I have onion and rice”)
- Retriever: Searches recipes from static dataset or public API
- Generator: Granite model creates recipe steps, substitutes, and tips
- Deployment: Hosted on IBM Cloud Lite using Watsonx Agent UI
- Interaction: Users ask questions via text interface.

INSTRUCTIONS & DEPLOYMENT



RESULT

User: I have curd, rice, and mustard seeds.

Agent: You can make Curd Rice. It's a simple South Indian dish.

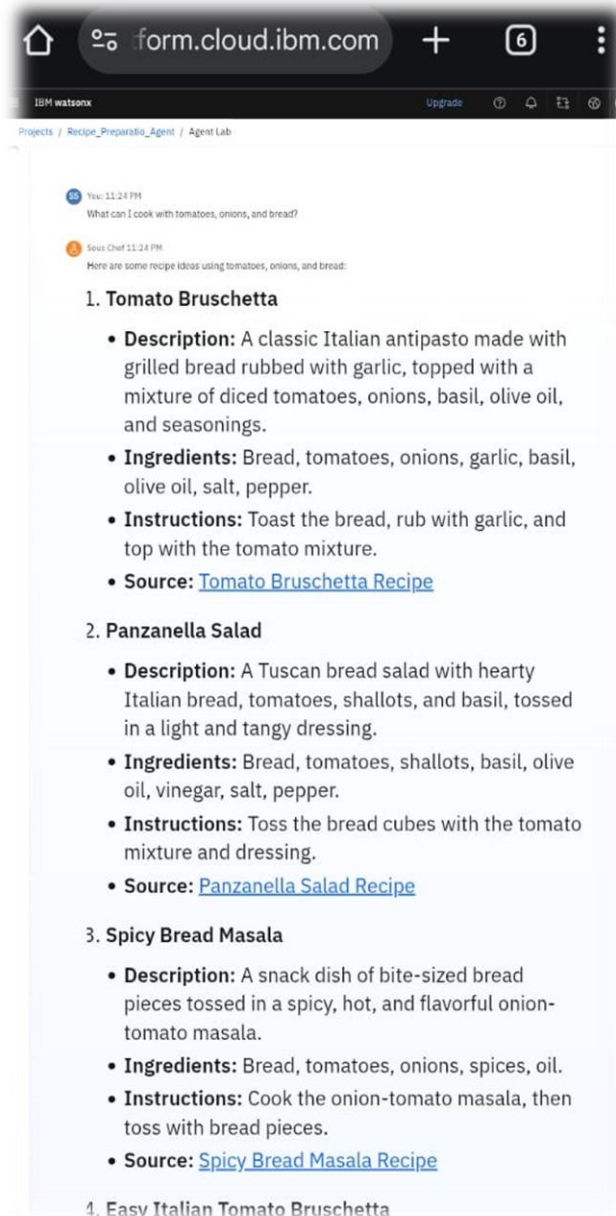
User: What can I cook with tomatoes, onions, and bread?

Agent: You can make Tomato Onion Bread Upma. It is a simple South Indian-style stir-fried dish made with leftover bread and common vegetables. Steps:

1. Chop tomatoes and onions.
2. Heat oil in a pan and add mustard seeds, curry leaves, and green chilies.
3. Sauté onions and tomatoes until soft.
4. Tear bread into small cubes and add them to the pan.
5. Toss everything well and cook for 2–3 minutes.
6. Garnish with coriander and serve hot.



OUTPUT OF THE PROJECT



CONCLUSION

- The Recipe Preparation Agent provides a simple, effective way to turn household ingredients into meals.
- It reduces waste, saves time, and supports users with customized cooking help using AI.
- It shows how agentic AI can support day-to-day tasks efficiently with minimal input.



FUTURE SCOPE

- Add voice and image input support
- Include multilingual interaction (Tamil, Hindi, etc.)
- Integrate with real-time recipe APIs
- Provide nutritional breakdowns and calorie counts
- Mobile app deployment for broader reach



REFERENCES

- 1. IBM Watsonx Documentation
- 2. IBM Granite Models Overview
- 3. IBM Cloud Lite Services
- 4. <https://developer.ibm.com/>

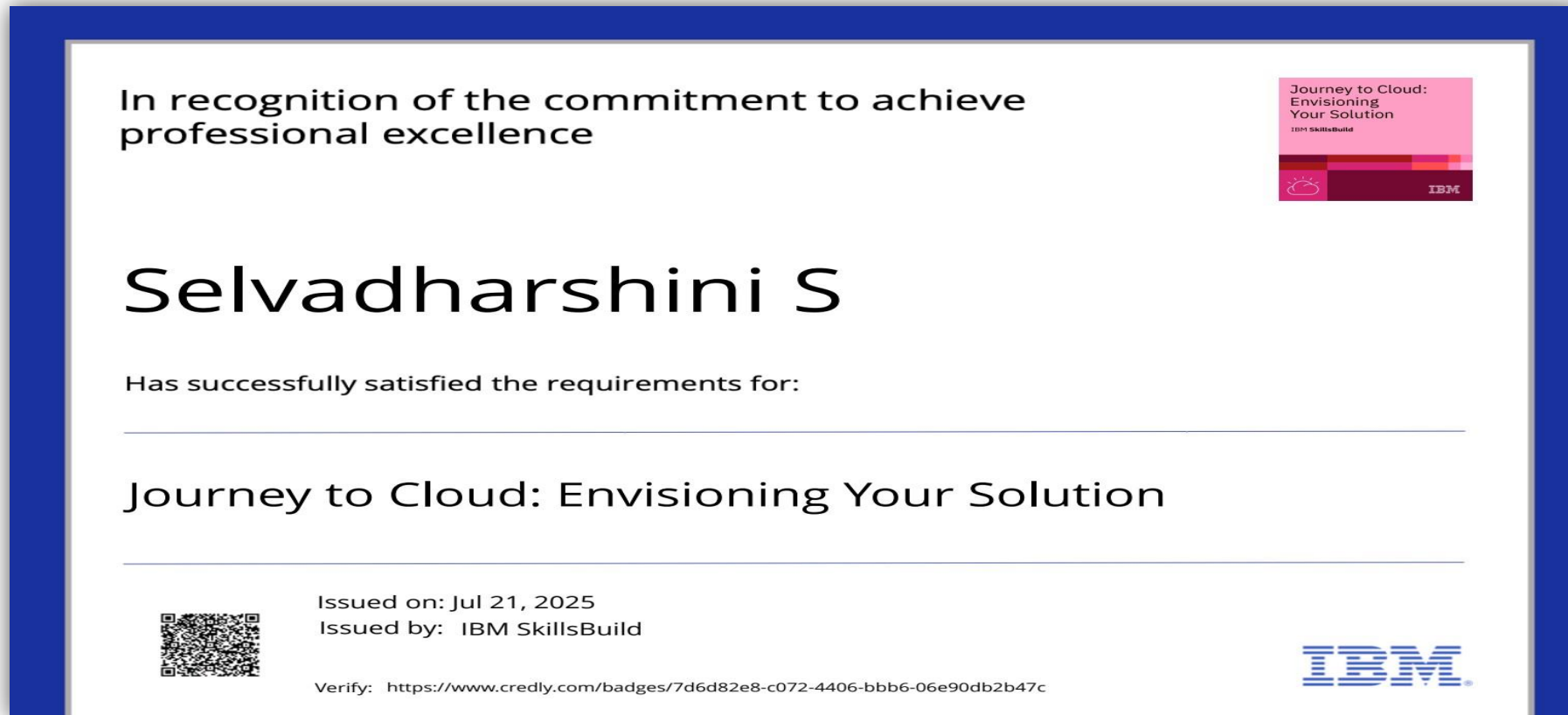
IBM CERTIFICATIONS

- Screenshot/ credly certificate(getting started with AI)



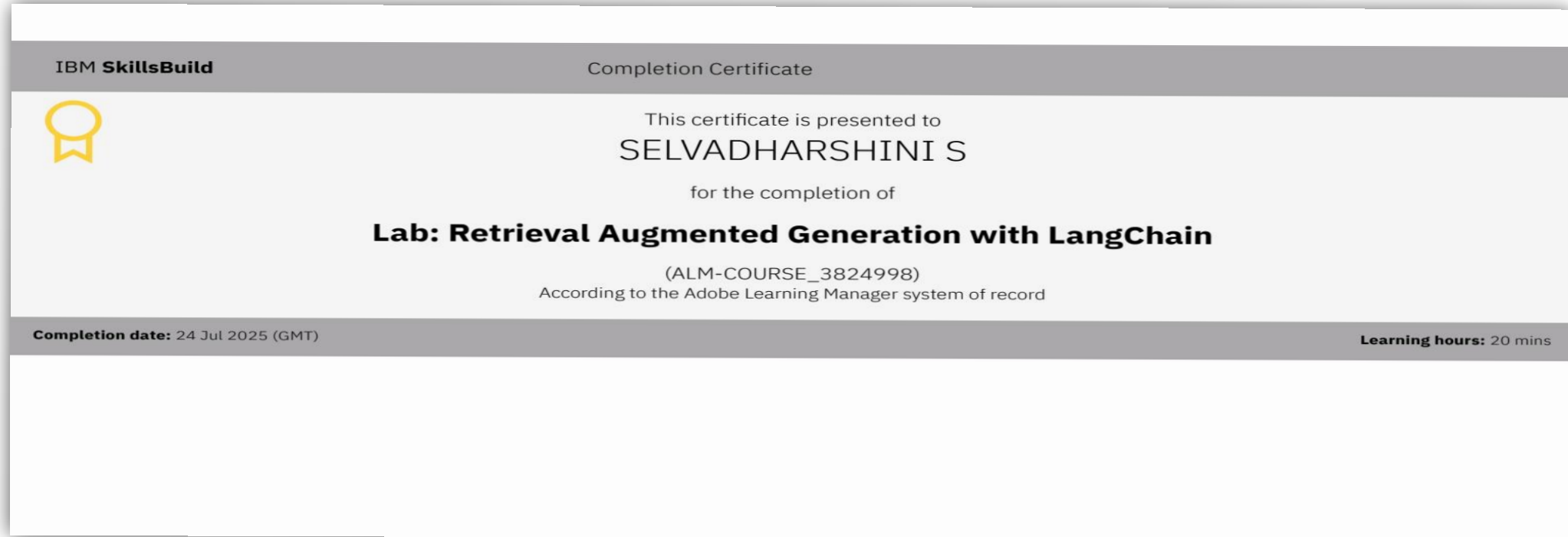
IBM CERTIFICATIONS

- Screenshot/ credly certificate(Journey to Cloud)



IBM CERTIFICATIONS

- Screenshot/ credly certificate(RAG Lab)





THANK YOU