CAPSTONE PROJECT

RECIPE PREPARATION AGENT

Presented By:
1. Aastha Pant-Graphic Era Deemed to be University-B.Tech.(CSE_AI)

edunet foundation

OUTLINE

- Problem Statement
- Proposed System/Solution
- System Development Approach
- Algorithm & Deployment
- Result (Output Image)
- Conclusion
- Future Scope
- References

PROBLEM STATEMENT

Example: In daily life, individuals often struggle to prepare meals with limited ingredients available at home. Searching for suitable recipes manually wastes time and can result in food wastage or underutilization of ingredients. There's a need for an intelligent system that helps users find practical recipes using only what's already in their kitchen, accommodating dietary preferences or restrictions as well.

PROPOSED SOLUTION

- We propose a Watsonx-powered Recipe Preparation Agent that helps users find meals based on the ingredients they currently have at home. This AI assistant is designed using Retrieval-Augmented Generation (RAG) and leverages IBM Watsonx services to retrieve and generate cooking steps and suggestions.

- Step-by-step overview:

  1. User Input: The user enters a list of ingredients (e.g., "onions, rice, and tomatoes").
  2. Vector Search: Using IBM Watsonx Knowledge Base (vector index), the agent searches the uploaded `.txt` file for recipes that match or relate to the entered ingredients.
  3. Response Generation: The AI generates step-by-step instructions using the prompt logic tailored for cooking guidance.
  4. Smart Substitutions: If any ingredient is missing, the agent suggests possible replacements.
  5. Sustainability: This system helps reduce food waste by providing usable recipes from available pantry items.

- Key Highlights:

  – Uses IBM Watsonx RAG for intelligent recipe retrieval

  – Minimal setup using IBM Cloud Lite's free tier

  – Simple `.txt` file as the knowledge base for recipe storage

  – Custom prompt to deliver natural and human-like cooking suggestions

SYSTEM APPROACH

- Technologies Used:

– IBM Watsonx.ai (Agent Lab)

– IBM Watsonx Knowledge Base (Vector Index)

– Retrieval-Augmented Generation (RAG) Model

– IBM Cloud Lite Free Tier

- Tools & Files:

– Custom `.txt` file with recipe ingredients and steps

– No third-party libraries or external datasets used

– IBM-generated runtime and sandbox project

Process:

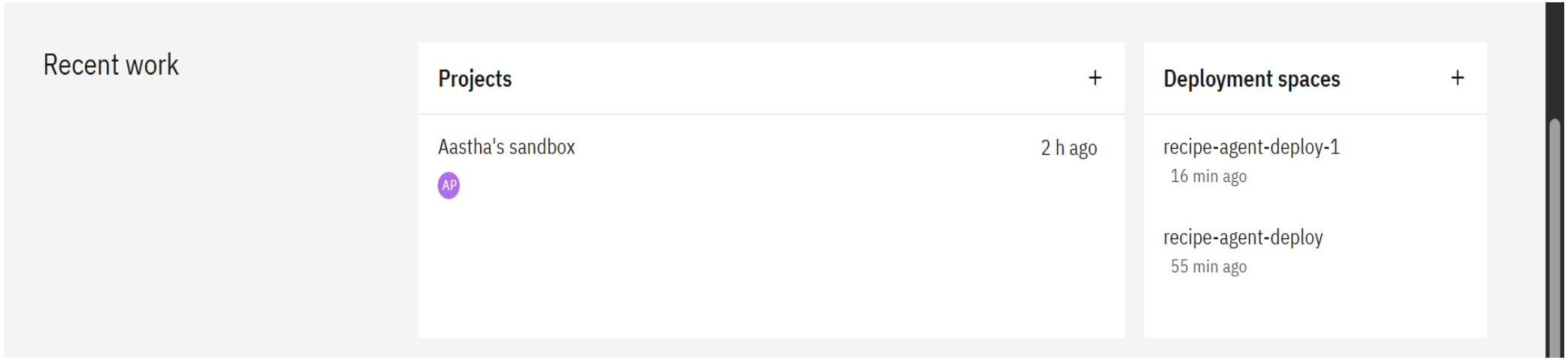
1. Project creation in IBM Cloud (Watsonx sandbox)
2. Upload `.txt` corpus into knowledge base
3. Configure RAG Agent with prompt and vector index
4. Test and deploy live AI Assistant

ALGORITHM & DEPLOYMENT

- Here's an example structure that gives the preview of our solution in this section:
- **Algorithm Selection:**
  - Retrieval-Augmented Generation (RAG) model. Embeds query and recipe text using vector embeddings. Searches indexed documents and generates tailored response.
- **Steps:**
  - User enters available ingredients. Agent retrieves closest recipe entries via vector search. Generates steps with substitutions if needed.
- **Deployment:**
  - Built and deployed within IBM Watsonx Agent Lab . Deployed as a chat-based assistant and can be reused in customer-facing interfaces or embedded Uis.

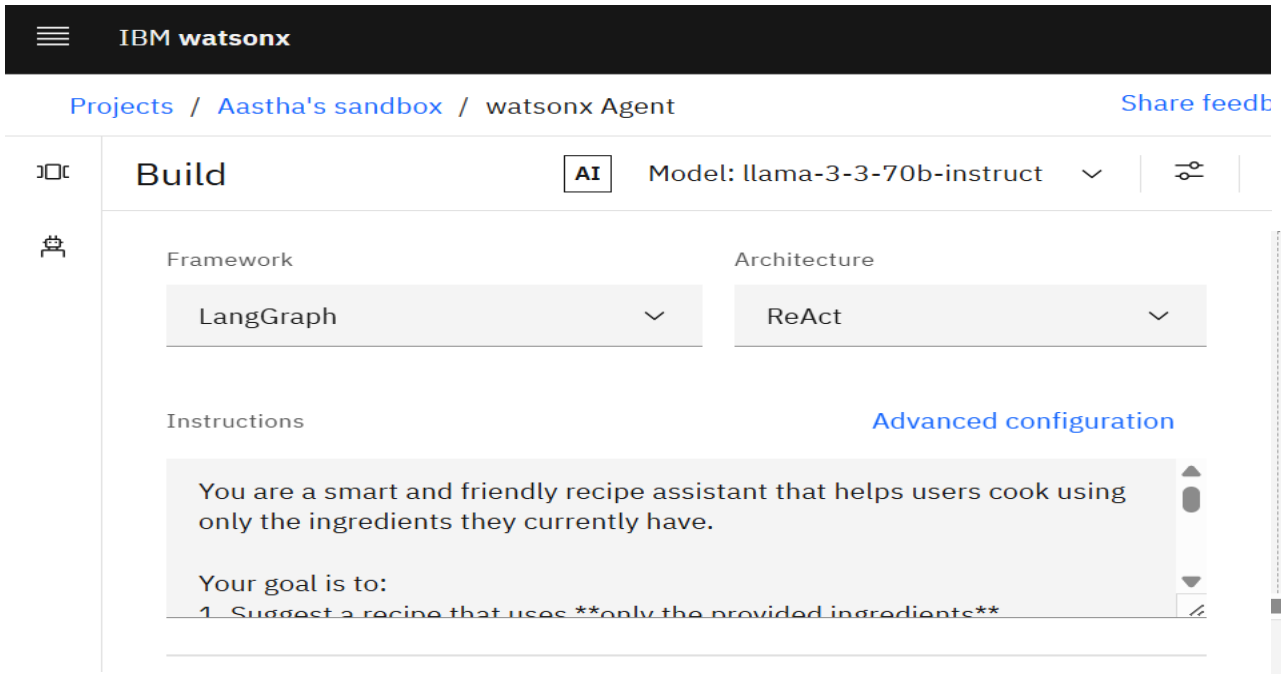
RESULT

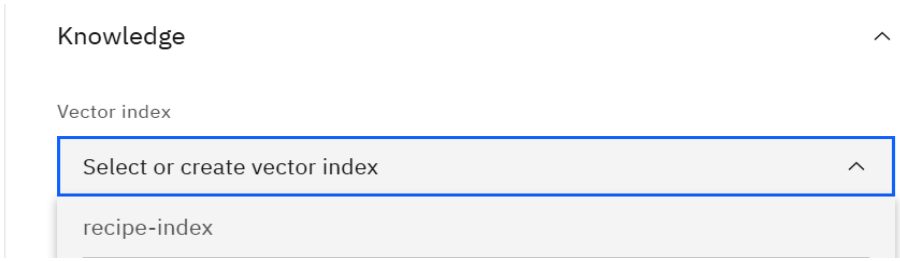
This depicts the name of the project as well as the deployment space for the same.

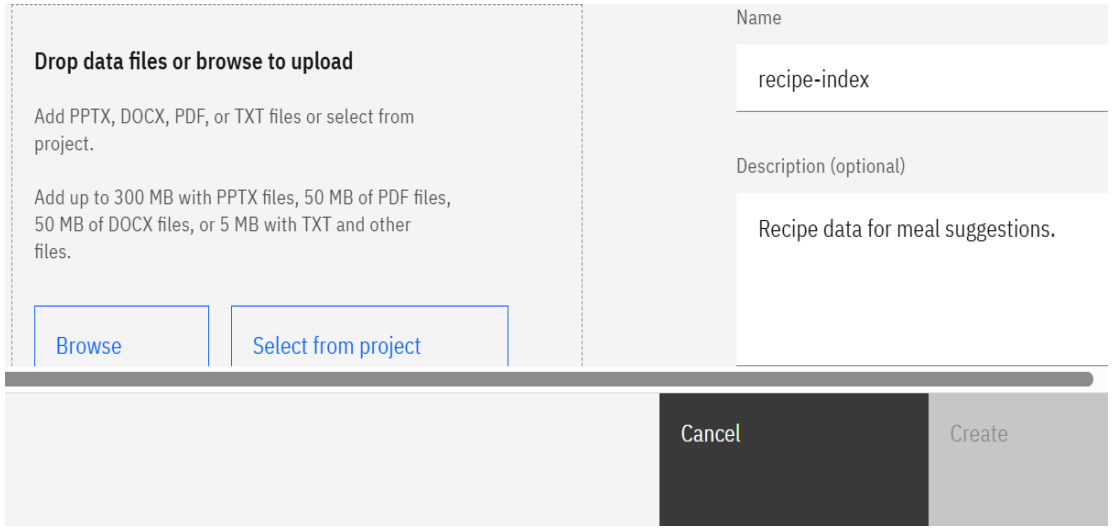


RESULT

Presenting the instructions and introducing RAG lab factor here by adding txt file/pdf.



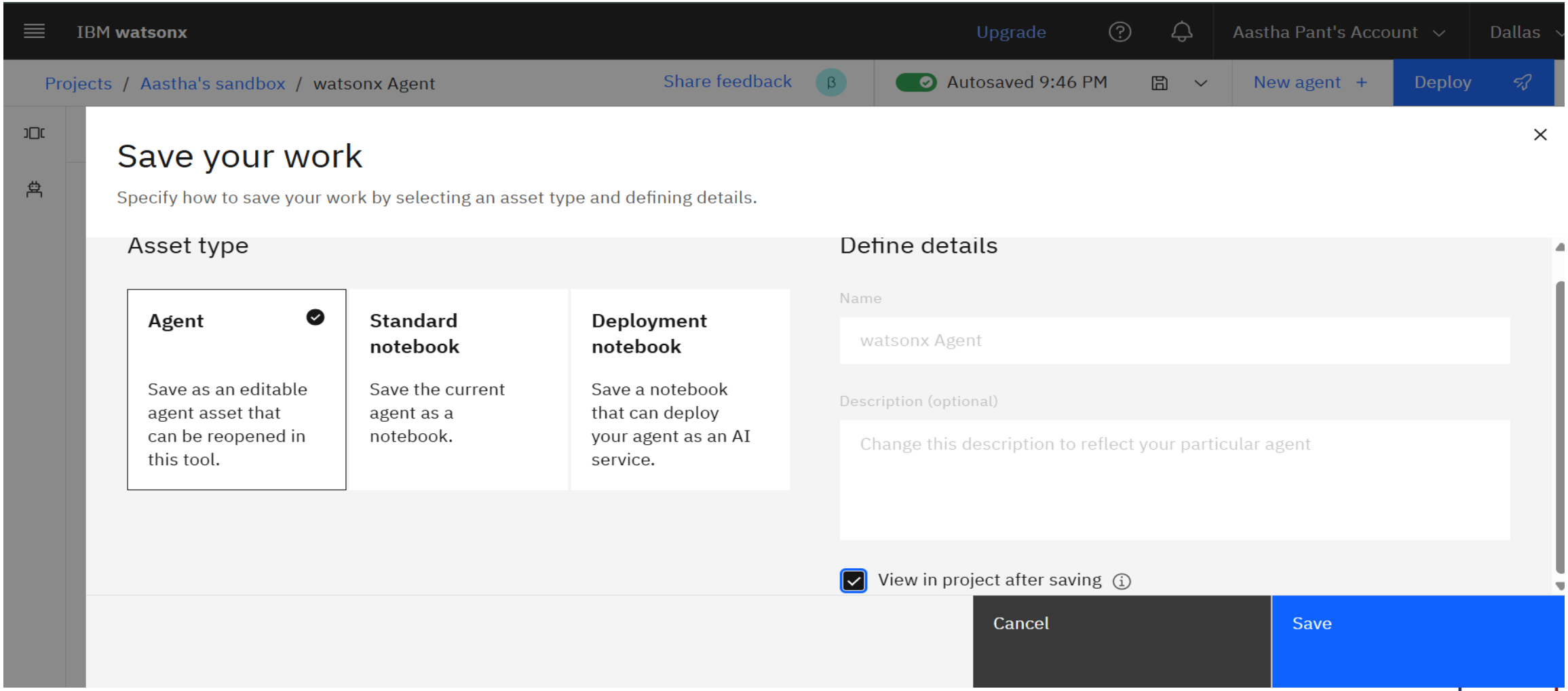




edunet foundation

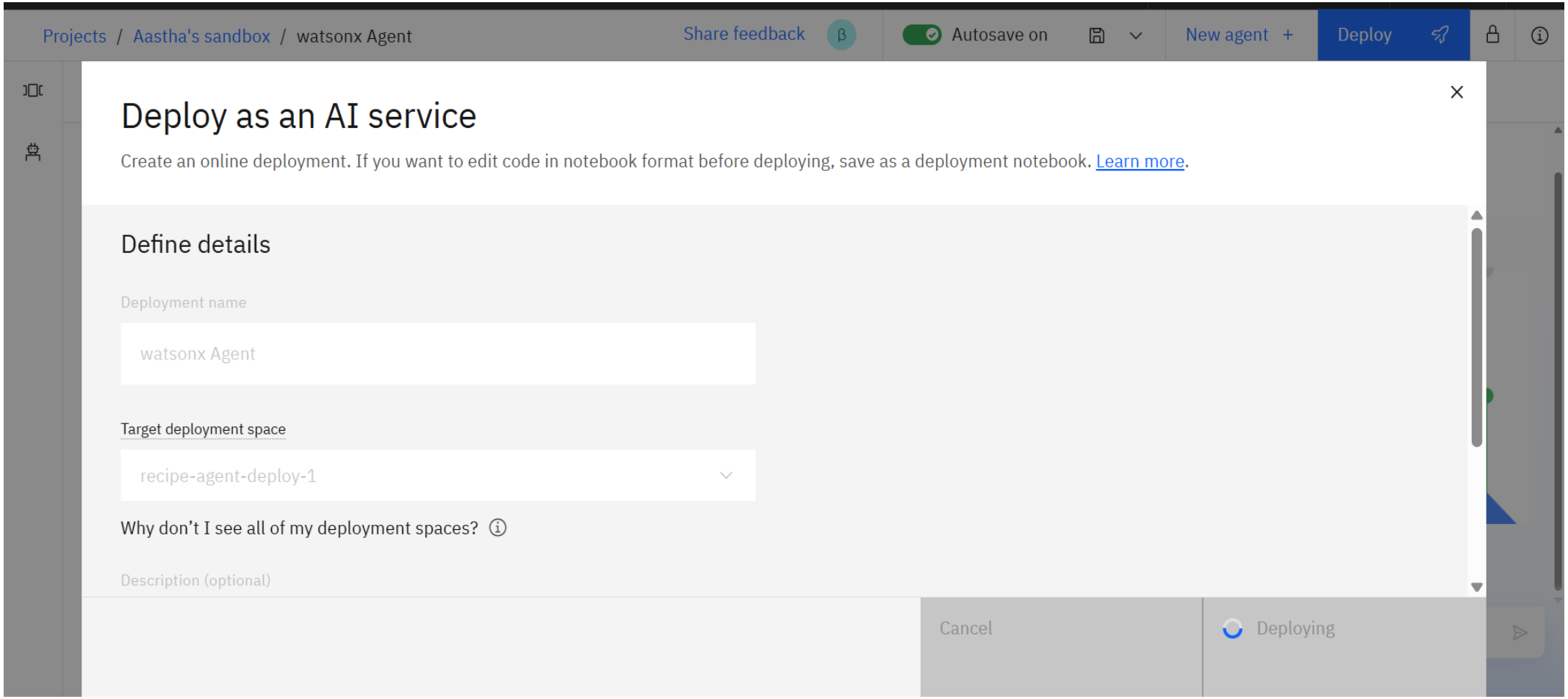
RESULT

Saving.



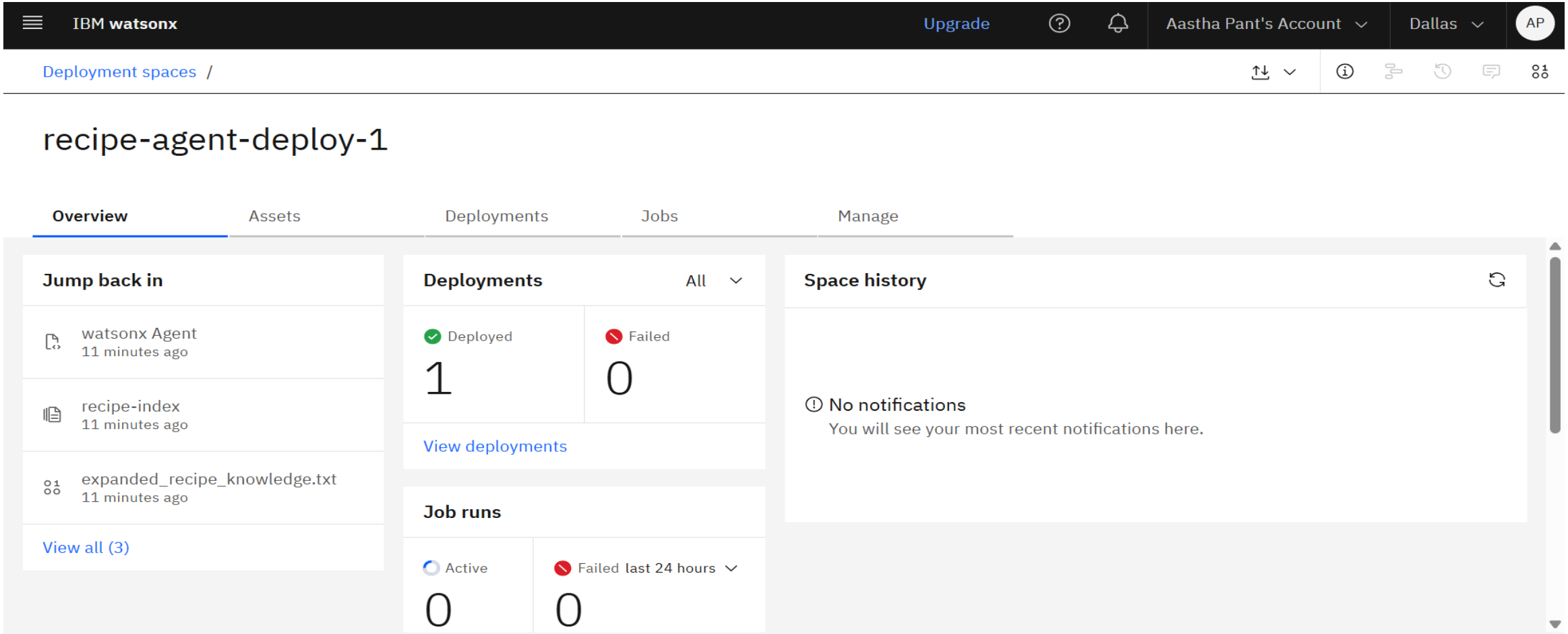
RESULT

Deployment.



RESULT

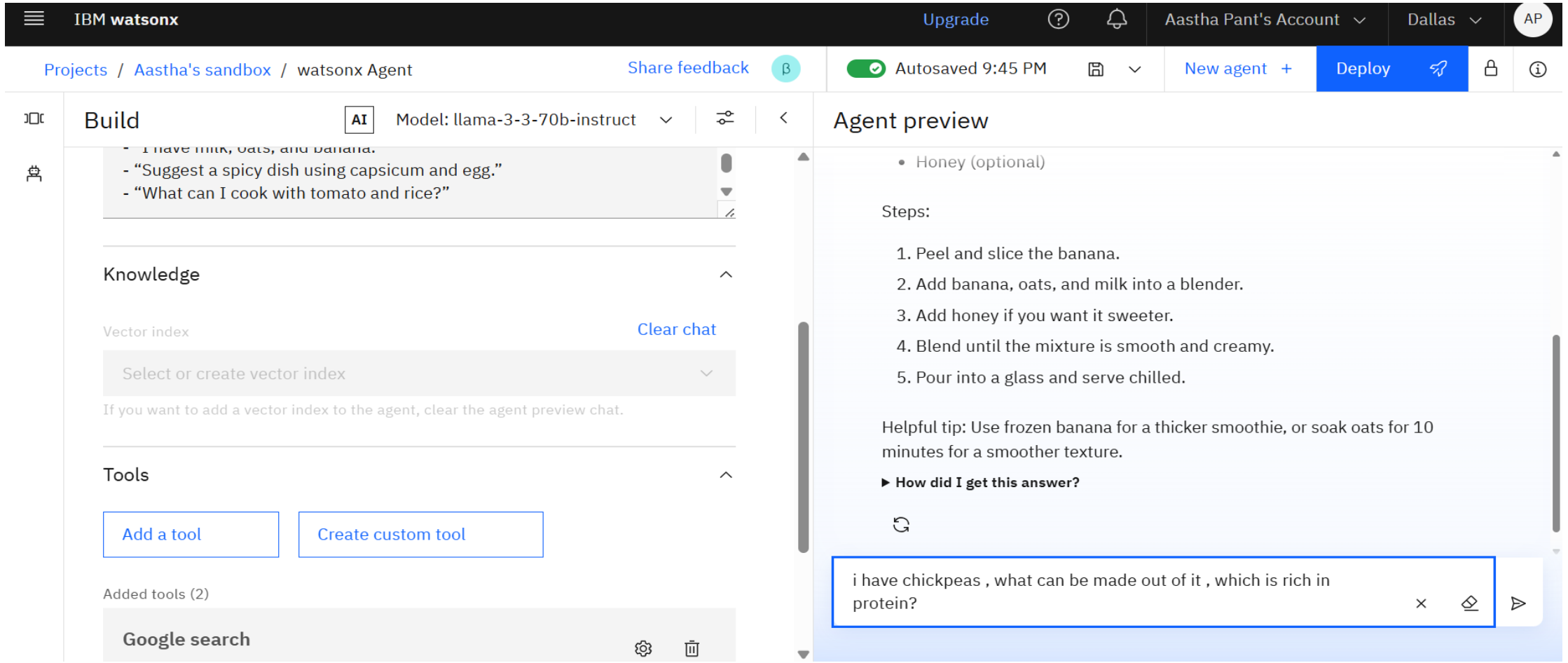
Successful Deployment.



edunet foundation

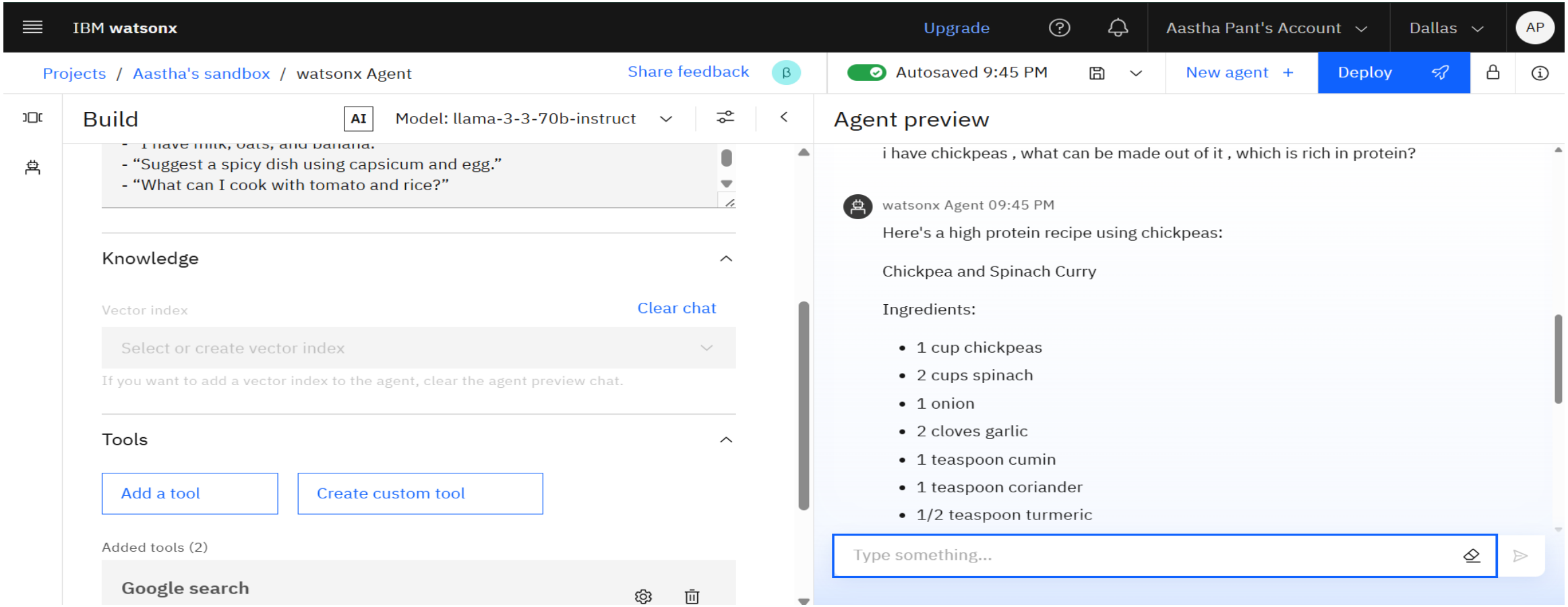
RESULT

Final giving Prompt and testing.



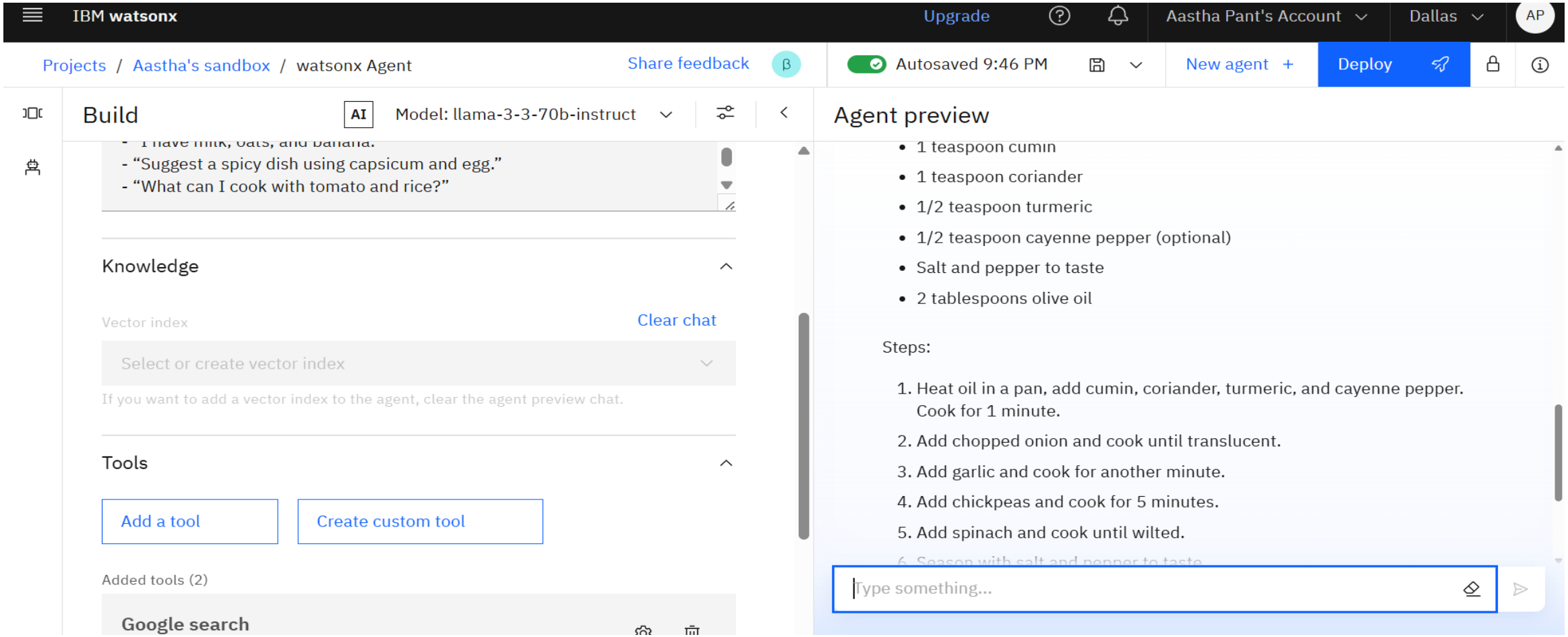
RESULT

Solution.



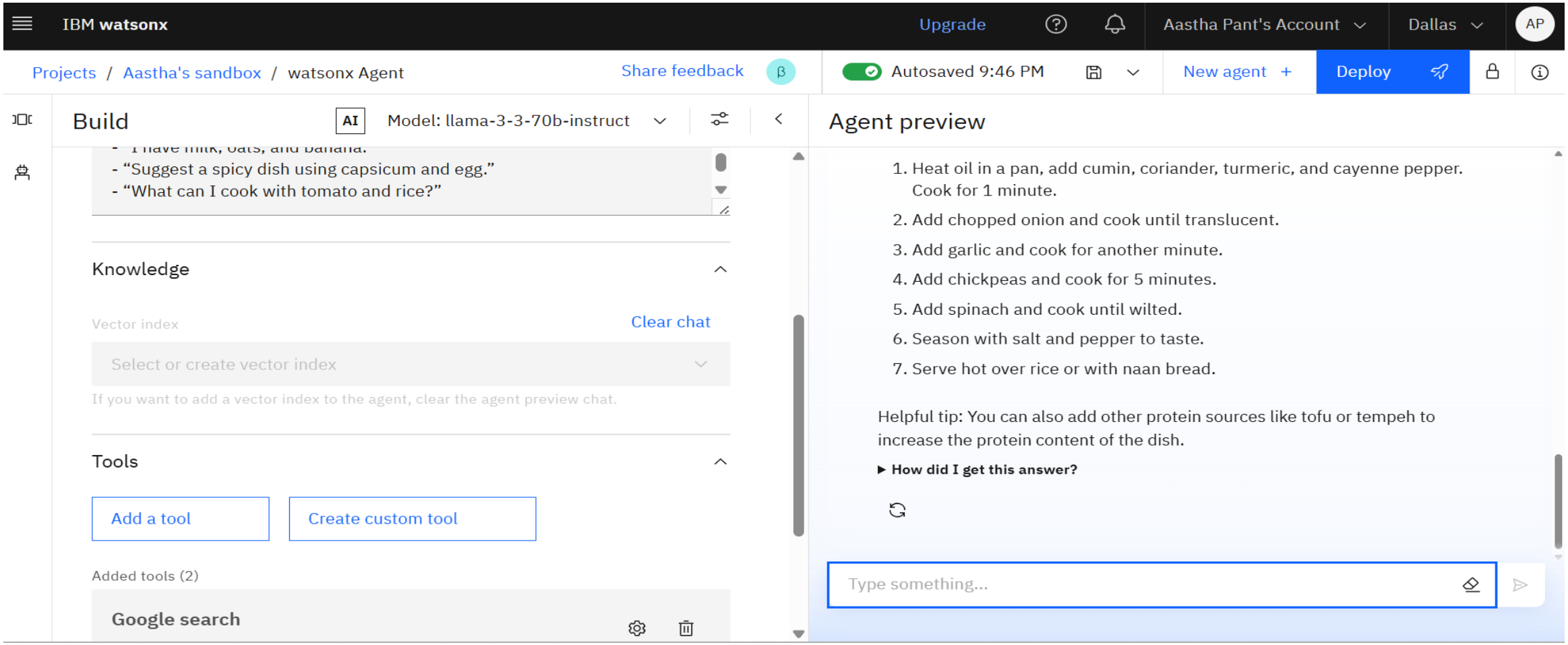
RESULT

Solution.



RESULT

Successful.



edunet foundation

CONCLUSION

- The Recipe Preparation Agent successfully demonstrates how AI can simplify cooking with limited ingredients. By using IBM Watsonx and a well-structured prompt with RAG, it delivers accurate and personalized recipe suggestions. This reduces food waste, saves time, and supports sustainable living practices. The agent works smoothly post-deployment and responds accurately to ingredient-based queries.

FUTURE SCOPE

- Future scope:

– Expand dataset to include international and regional cuisines.

– Add voice input and speech-based instructions.

– Integrate calorie calculation and nutritional facts.

– Connect with grocery APIs for missing ingredient suggestions.

– Multi-language recipe support for broader audience.

REFERENCES

- IBM Watsonx Documentation
- IBM Knowledge Base: Vector Indexing
- RAG model principles from Meta AI
- Dataset: Custom recipe `.txt` file
- https://www.ibm.com/cloud/watsonx
- Skillsbuild courses (AI & Cloud)

IBM CERTIFICATIONS

In recognition of the commitment to achieve professional excellence

Aastha Pant

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence

Issued on: Jul 20, 2025
Issued by: IBM SkillsBuild

Verify: https://www.credly.com/badges/e40c20dc-d673-4db2-8819-fd98ea6530d3

IBM

edunet foundation

IBM CERTIFICATIONS

In recognition of the commitment to achieve professional excellence

Journey to Cloud: Envisioning Your Solution
IBM SkillsBuild

Aastha Pant

Has successfully satisfied the requirements for:

Journey to Cloud: Envisioning Your Solution

Issued on: Jul 20, 2025
Issued by: IBM SkillsBuild

Verify: https://www.credly.com/badges/93ec0efd-e147-454f-9484-ec99bb7cc368

IBM

edunet foundation

IBM CERTIFICATIONS

7/24/25, 10:27 PM Completion Certificate | SkillsBuild

IBM **SkillsBuild**

Completion Certificate

This certificate is presented to

Aastha Pant

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

https://skills.yourlearning.ibm.com/certificate/ALM-COURSE_3824998 1/1

edunet foundation

THANK YOU

edunet foundation