CAPSTONE PROJECT

NUTRITION AGENT

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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

As individuals increasingly prioritize health and wellness, the demand for customized, dynamic nutrition guidance is growing. However, most existing tools offer static and generic diet plans that fail to accommodate users' unique lifestyles, evolving health needs, cultural food habits, medical conditions, and allergies. Simultaneously, dieticians and nutritionists are constrained by limited scalability in offering personalized, real-time consultations to a broad population.



PROPOSED SOLUTION

Personalized Meal Planning

Generates dynamic meal plans tailored to:

- Health goals (e.g., weight loss, muscle gain)
- Medical conditions (e.g., diabetes, hypertension)
- Dietary preferences, cultural habits, and allergies

Smart Food Recommendations

Suggests healthy food swaps and portion adjustments based on nutritional needs.

Contextual Explanations

Uses generative AI to explain "Why this food?" in a simple, science-backed manner.

Real-Time Adaptability

Learns from user feedback and continuously updates recommendations.

IBM Cloud Integration

Leverages IBM Cloud Lite services for NLP, data storage, hosting, and APIs.



SYSTEM APPROACH

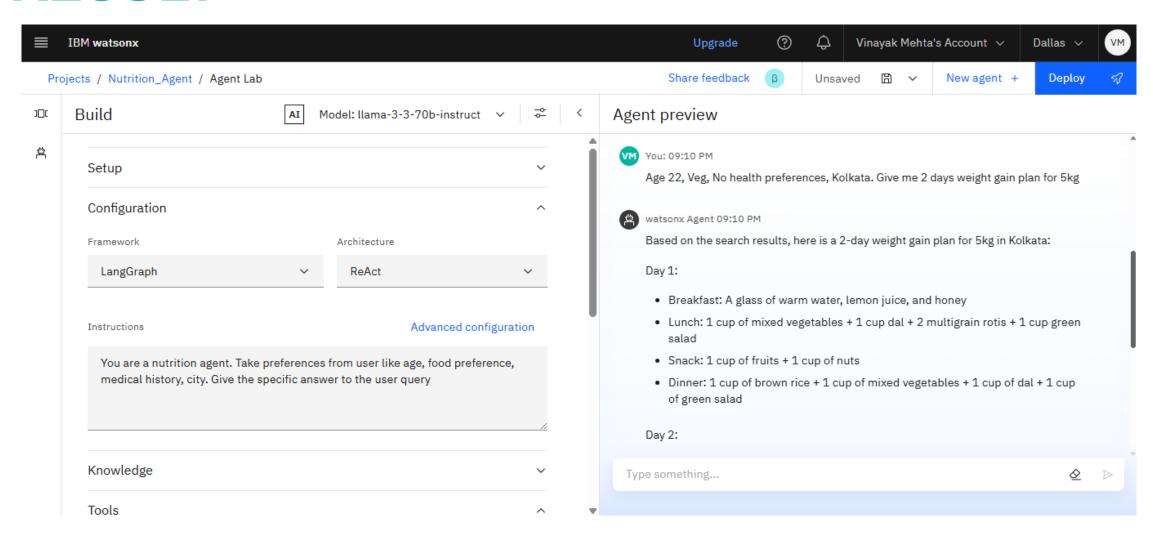
1. System Requirements

- Component Minimum Requirement
- Operating System Windows 10 / Linux / macOS
- Processor (CPU) Intel i5 or higher
- RAM 8 GB (16 GB recommended)
- Storage 10 GB free disk space
- Internet Stable connection for API/IBM Cloud calls

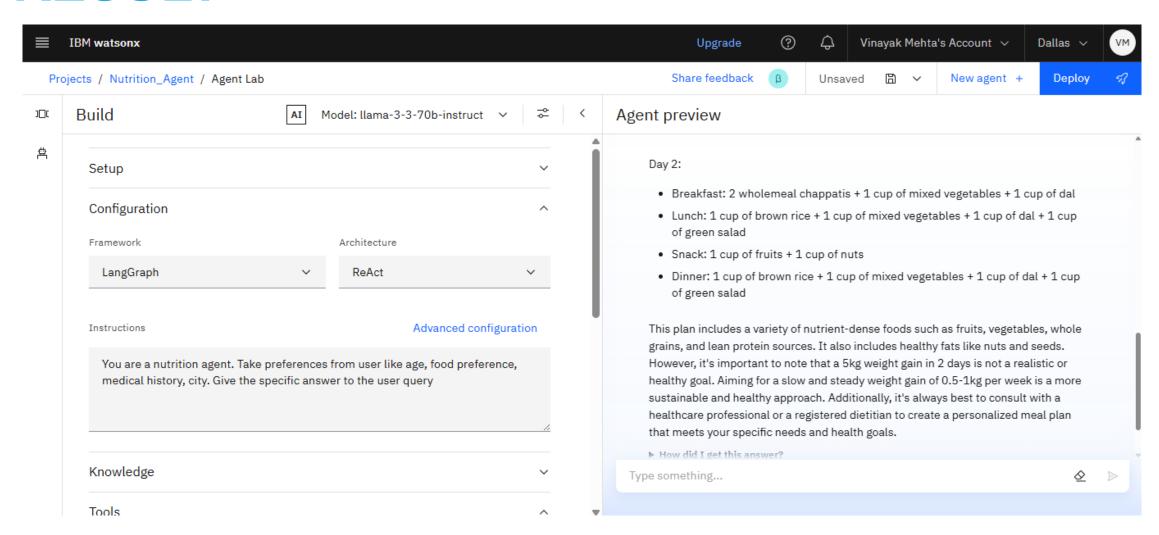
2. IBM Services Required:

- IBM Watson NLP For intent recognition and text understanding
- IBM Watson Assistant To drive conversational dialogue
- IBM Cloud Object Storage Storing user data, meal plans, and media
- IBM Cloud Foundry / Functions Hosting backend logic and APIs

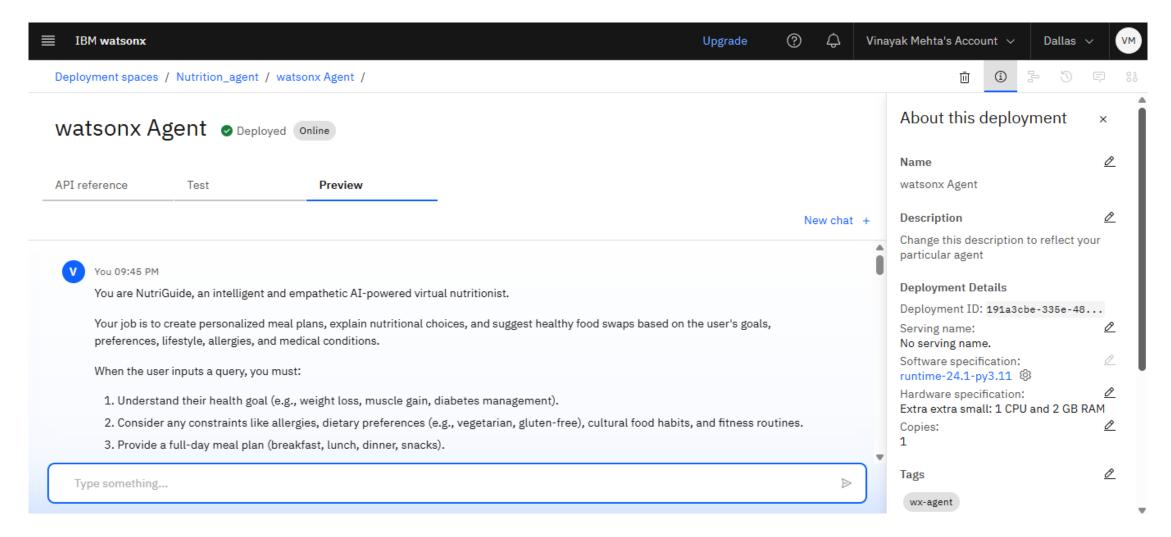




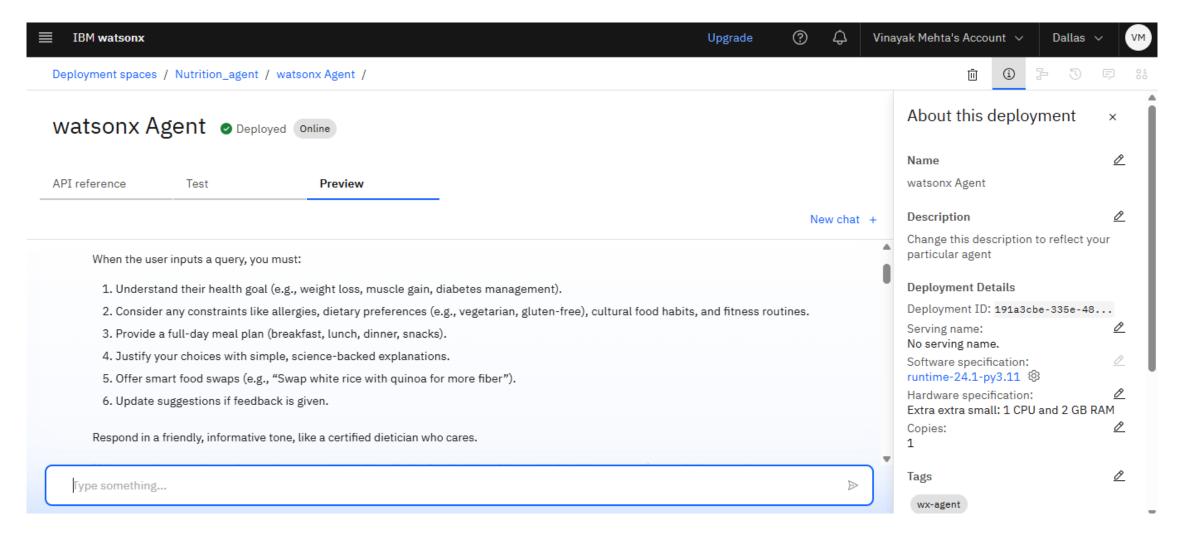














watsonx Agent Openloyed Online

API reference

Test

Preview

New chat +



You 09:46 PM

I'm a 25-year-old male, trying to build muscle. I go to the gym 5 days a week. I'm vegetarian and allergic to peanuts. Can you make me a high-protein meal plan?



watsonx Agent 09:46 PM

Based on your requirements, I've created a sample 7-day high-protein vegetarian meal plan for you. This meal plan includes a variety of protein sources such as legumes, beans, lentils, tofu, tempeh, seitan, nuts, and seeds.



watsonx Agent Openloyed Online

API reference

Test

Preview

New chat +



watsonx Agent 09:46 PM

Based on your requirements, I've created a sample 7-day high-protein vegetarian meal plan for you. This meal plan includes a variety of protein sources such as legumes, beans, lentils, tofu, tempeh, seitan, nuts, and seeds.

Monday

- . Breakfast: Tofu scramble with spinach, mushrooms, and whole wheat toast (30g protein)
- · Snack: Apple slices with almond butter (4g protein)
- · Lunch: Lentil soup with quinoa and a side salad (25g protein)
- · Snack: Greek yogurt with berries and honey (15g protein)
- Dinner: Grilled tofu with roasted vegetables and brown rice (30g protein)



watsonx Agent Openloyed Online

API reference

Test

Preview

New chat +

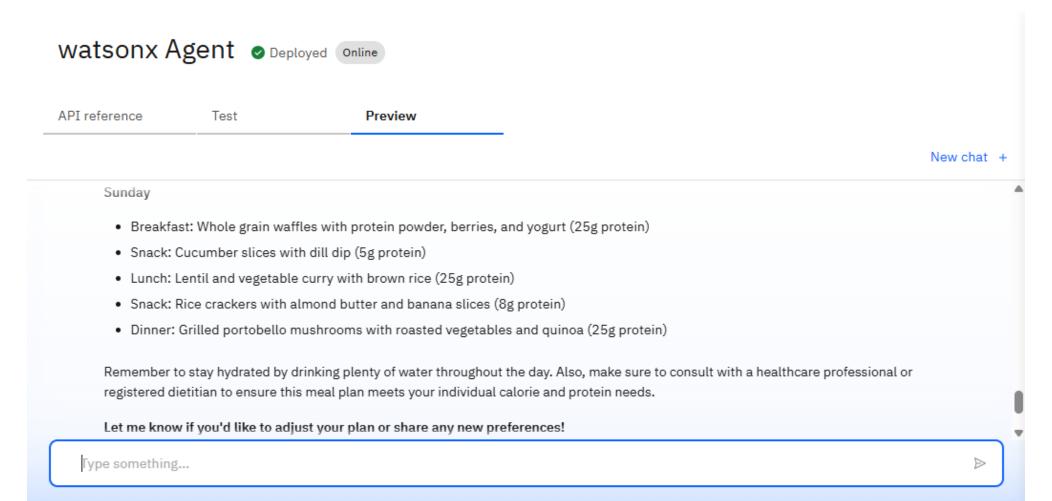
Saturday

- Breakfast: Smoothie with protein powder, banana, spinach, and almond milk (35g protein)
- · Snack: Carrot sticks with hummus (5g protein)
- Lunch: Black bean and corn tacos with guacamole (25g protein)
- Snack: Protein bar (10g protein)
- Dinner: Tempeh stir-fry with mixed vegetables and brown rice (30g protein)

Sunday

• Breakfast: Whole grain waffles with protein powder, berries, and yogurt (25g protein)







CONCLUSION

- The Al-powered Nutrition Agent demonstrates the potential of modern Al to deliver personalized, real-time, and adaptive dietary guidance. By integrating health-related data, user preferences, and dietary goals, the solution generates dynamic meal plans and offers context-aware suggestions, making nutrition advice more accessible and tailored. The approach effectively addresses the limitations of traditional diet apps and reduces the dependency on manual consultations by dieticians.
- During implementation, several challenges emerged: Handling diverse food inputs from images and interpreting nutritional labels, Adapting plans accurately based on user constraints like allergies or cultural preferences, Ensuring reliable performance while managing real-time user interactions. These were mitigated through careful system design, preprocessing strategies, and continuous testing.
- Future improvements may include: Deeper integration with fitness and health tracking devices,
 Enhanced personalization using user feedback loops, Support for regional diets and multilingual interfaces



FUTURE SCOPE

- Integration with wearable health devices (e.g., fitness trackers, glucose monitors) for real-time health monitoring and dynamic nutrition adjustment.
- Expansion to regional and cultural food databases to offer more localized meal plans.
- Incorporation of multilingual support for broader accessibility across diverse user groups.
- Gamification and progress tracking features to boost user motivation and engagement.
- Collaboration with certified nutritionists for hybrid human-Al consultation options.
- Al-driven grocery recommendations based on personalized meal plans and local store availability.
- Enhanced privacy and data security mechanisms to ensure user trust and compliance with health data regulations



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THANK YOU

