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# CAPSTONE PROJECT

## NUTRITION AGENT

**Presented By:**  
**Vinayak Mehta – Parul Institute of Technology - 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

- 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, dietitians 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

# RESULT

IBM watsonx

Upgrade Vinayak Mehta's Account Dallas VM

Projects / Nutrition\_Agent / Agent Lab

Share feedback Unsaved New agent + Deploy

Build

AI

Model: llama-3-3-70b-instruct

Setup

Configuration

Framework

LangGraph

Architecture

ReAct

Instructions [Advanced configuration](#)

You are a nutrition agent. Take preferences from user like age, food preference, medical history, city. Give the specific answer to the user query

Knowledge

Tools

Agent preview

VM You: 09:10 PM

Age 22, Veg, No health preferences, Kolkata. Give me 2 days weight gain plan for 5kg

watsonx Agent 09:10 PM

Based on the search results, here is a 2-day weight gain plan for 5kg in Kolkata:


Day 1:





- Breakfast: A glass of warm water, lemon juice, and honey
- Lunch: 1 cup of mixed vegetables + 1 cup dal + 2 multigrain rotis + 1 cup green salad
- Snack: 1 cup of fruits + 1 cup of nuts
- Dinner: 1 cup of brown rice + 1 cup of mixed vegetables + 1 cup of dal + 1 cup of green salad

Day 2:





Type something...

# RESULT

 IBM watsonx


Upgrade Vinayak Mehta's Account  Dallas  VM



Projects / Nutrition\_Agent / Agent Lab


Share feedback  Unsaved   New agent + Deploy 


Build

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Model: llama-3-3-70b-instruct 


Setup 

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Instructions

[Advanced configuration](#)

You are a nutrition agent. Take preferences from user like age, food preference, medical history, city. Give the specific answer to the user query

Knowledge 


Tools 



Agent preview

Day 2:


- Breakfast: 2 wholemeal chappatis + 1 cup of mixed vegetables + 1 cup of dal
- Lunch: 1 cup of brown rice + 1 cup of mixed vegetables + 1 cup of dal + 1 cup of green salad
- Snack: 1 cup of fruits + 1 cup of nuts
- Dinner: 1 cup of brown rice + 1 cup of mixed vegetables + 1 cup of dal + 1 cup of green salad



This plan includes a variety of nutrient-dense foods such as fruits, vegetables, whole grains, and lean protein sources. It also includes healthy fats like nuts and seeds. However, it's important to note that a 5kg weight gain in 2 days is not a realistic or healthy goal. Aiming for a slow and steady weight gain of 0.5-1kg per week is a more sustainable and healthy approach. Additionally, it's always best to consult with a healthcare professional or a registered dietitian to create a personalized meal plan that meets your specific needs and health goals.


 How did I get this answer?


Type something...  


# RESULT

 IBM watsonx







Upgrade

Vinayak Mehta's Account 

Dallas 

VM 


Deployment spaces / Nutrition\_agent / watsonx Agent /



## watsonx Agent Deployed

API referenceTestPreview

New chat +


 You 09:45 PM

You are NutriGuide, an intelligent and empathetic AI-powered virtual nutritionist.


Your job is to create personalized meal plans, explain nutritional choices, and suggest healthy food swaps based on the user's goals, preferences, lifestyle, allergies, and medical conditions.

When the user inputs a query, you must:


1. Understand their health goal (e.g., weight loss, muscle gain, diabetes management).
2. Consider any constraints like allergies, dietary preferences (e.g., vegetarian, gluten-free), cultural food habits, and fitness routines.
3. Provide a full-day meal plan (breakfast, lunch, dinner, snacks).

Type something... 

### About this deployment

Name


watsonx Agent



Description


Change this description to reflect your particular agent


Deployment Details


Deployment ID: 191a3cbe-335e-48...

Serving name:No serving name.

Software specification:runtime-24.1-py3.11 

Hardware specification:Extra extra small: 1 CPU and 2 GB RAM

Copies:1


Tags




wx-agent







edunet  
foundation



# RESULT

 IBM watsonx

Upgrade Vinayak Mehta's Account ▾ Dallas ▾  VM

Deployment spaces / Nutrition\_agent / watsonx Agent /      

## watsonx Agent ✔ Deployed Online


API referenceTestPreview

New chat +

When the user inputs a query, you must:

1. Understand their health goal (e.g., weight loss, muscle gain, diabetes management).
2. Consider any constraints like allergies, dietary preferences (e.g., vegetarian, gluten-free), cultural food habits, and fitness routines.
3. Provide a full-day meal plan (breakfast, lunch, dinner, snacks).
4. Justify your choices with simple, science-backed explanations.
5. Offer smart food swaps (e.g., "Swap white rice with quinoa for more fiber").
6. Update suggestions if feedback is given.

Respond in a friendly, informative tone, like a certified dietician who cares.



### About this deployment

Name

watsonx Agent


Description

Change this description to reflect your particular agent

Deployment Details

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Copies: 1

Tags

wx-agent

# RESULT

watsonx Agent ✓ Deployed 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.

# RESULT

watsonx Agent ✓ Deployed 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)

# RESULT

watsonx Agent  Deployed 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)

# RESULT

watsonx Agent ✓ Deployed Online

API reference

Test

Preview

New chat +

Sunday

- Breakfast: Whole grain waffles with protein powder, berries, and yogurt (25g protein)
- Snack: Cucumber slices with dill dip (5g protein)
- Lunch: Lentil and vegetable curry with brown rice (25g protein)
- Snack: Rice crackers with almond butter and banana slices (8g protein)
- Dinner: Grilled portobello mushrooms with roasted vegetables and quinoa (25g protein)

Remember to stay hydrated by drinking plenty of water throughout the day. Also, make sure to consult with a healthcare professional or registered dietitian to ensure this meal plan meets your individual calorie and protein needs.

Let me know if you'd like to adjust your plan or share any new preferences!

Type something...



# CONCLUSION

- The AI-powered Nutrition Agent demonstrates the potential of modern AI 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 dietitians.
- 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-AI consultation options.
- **AI-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

# REFERENCES

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IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

Vinayak Mehta

for the completion of

**Lab: Retrieval Augmented Generation with  
LangChain**

(ALM-COURSE\_3824998)

According to the Adobe Learning Manager system of record

**Completion date:** 17 Jul 2025 (GMT)

**Learning hours:** 20 mins



**THANK YOU**