VISHWAKARMA UNIVERSITY
Maximising Human Potential

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Faculty	**Science and Technology**
Department	**Computer Engineering**
Course Name	**PBL**
Course Code	**BTECCE24304**
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IBM Project 2

1. Problem Statement

In today's busy world, maintaining a balanced diet and understanding nutritional needs can be challenging.

Many people struggle to find reliable, personalized guidance about healthy eating, calorie intake, or lifestyle habits.

The goal of this project is to develop an AI-powered nutrition chatbot — NutriMind — that provides personalized diet advice, meal plans, BMI calculation, and general wellness suggestions through an intelligent, interactive chat interface.

2. Objective

To create an AI chatbot using IBM Watsonx Assistant that acts as a personal nutrition guide.

To provide diet recommendations and BMI-based insights to users.

To develop a system that supports open-ended natural conversations and integrates easily with other platforms (e.g., WhatsApp).

To enhance user health awareness using AI-driven suggestions and personalized data.

3. Tools and Technologies Used

IBM Watsonx Assistant	Main chatbot development platform
IBM Watsonx.ai (Optional)	Large Language Model (LLM) for natural responses
IBM Cloud	Deployment and API integration
Twilio WhatsApp Sandbox	WhatsApp connectivity for chatbot
JSON Format	Export and import chatbot data
Python (optional)	Testing or custom LLM connection

4. Technical Flow of System

Step 1: User starts a chat with the NutriMind Assistant on web/WhatsApp.

Step 2: The assistant greets the user and collects information such as name, age, weight, height, and diet type.

Step 3: BMI is calculated internally using:

$$\text{BMI} = \frac{\text{weight (kg)}}{(\text{height (m)})^2}$$

Step 5: The assistant also offers custom plans such as detox, clear skin, energy boost, and women's health.

Step 6: (Optional) LLM or Watsonx.ai model is integrated to respond to open-ended questions.

Step 7: All responses are displayed to the user through IBM's conversational interface or WhatsApp.

User → Watsonx Assistant (Actions) → AI Logic → Output Response → User

5. Steps Followed in Development

Step 1: Project Setup

Logged in to IBM Cloud and created a new Watsonx Assistant instance.

Configured project name as NutriMind Assistant.

Step 2: Creating Actions

Six major Actions were created inside Watsonx Assistant:

1. Greeting: Welcomes user and asks for their name.

2. Profile Setup: Collects details – age, height, weight, activity level, and diet preference.

3. BMI Calculator: Calculates BMI and classifies the result (underweight, healthy, overweight).

4. Meal & Health Food Suggestions: Recommends suitable diets like detox, clear skin, or energy-boosting meals.

5. Personalized Health Plans: Offers goal-based suggestions like immunity boost, women's health, or muscle gain.

6. Goodbye / End Chat: Bids farewell politely and thanks the user for chatting.

Step 3: Testing the Actions

Used Watsonx Assistant's Preview mode to simulate real user conversations.

Tested different inputs (veg, non-veg, low energy, high protein).

Verified that the assistant handles incorrect inputs gracefully with validation prompts.

Step 4: Integration

Linked the Watsonx Assistant with Twilio WhatsApp Sandbox to allow mobile chat interaction.

Configured webhook URLs and authentication credentials through IBM Cloud.

Step 5: Optional LLM Integration

Added integration setup for Watsonx.ai (Granite or Mistral model).

This allows NutriMind to answer open-ended health and nutrition questions.

6. Deployment

Steps for Deployment:

1. From Watsonx Assistant, clicked on “Deployments” → “Web Chat” or “WhatsApp Integration.”

2. Configured the environment for public access.

3. Generated deployment API key and workspace URL.

4. Connected assistant to Twilio Sandbox for testing through WhatsApp.

5. Verified chat response from a mobile device.

Deployment

Output:

Once deployed, the chatbot can interact directly via web or WhatsApp, providing meal plans, calorie suggestions, and daily nutrition guidance.

Web Chat : https://web-chat.global.assistant.watson.appdomain.cloud/preview.html?backgroundImageURL=https%3A%2F%2Feu-gb.assistant.watson.cloud.ibm.com%2Fpublic%2Fimages%2Fupx-0ee14ed6-55cb-470c-89f0-2b4e3212857c%3A%3A6fb92257-2fab-4c2c-95df-f7f46ea502fc&integrationID=ba4883aa-5085-4c57-8630-4262f2f8c85a&region=eu-gb&serviceInstanceID=0ee14ed6-55cb-470c-89f0-2b4e3212857c

Whatsapp :

Send a WhatsApp message

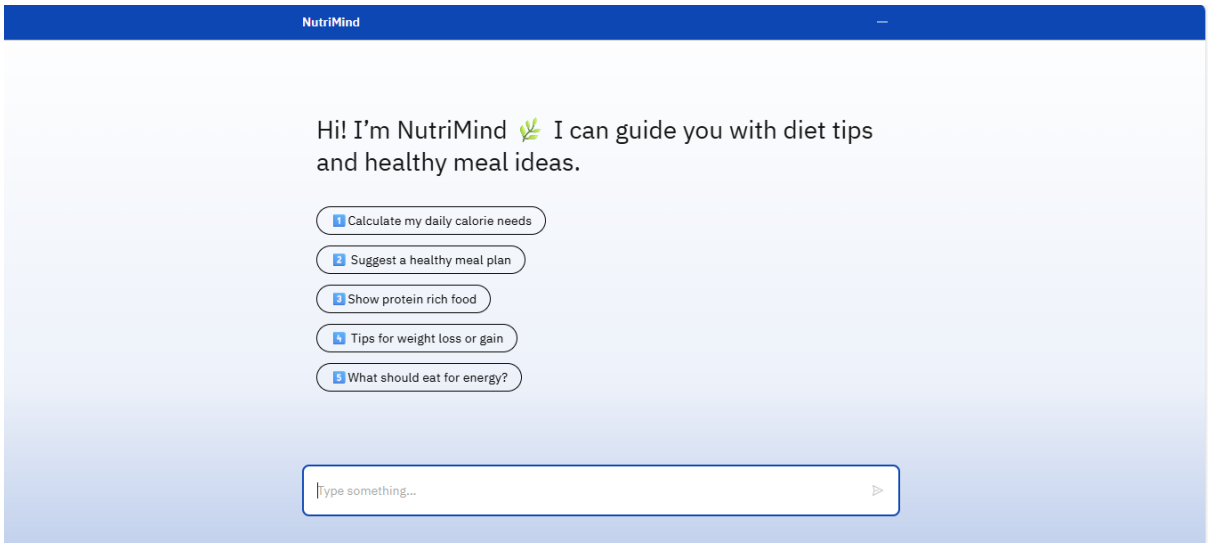
Use WhatsApp and send a message from your device to

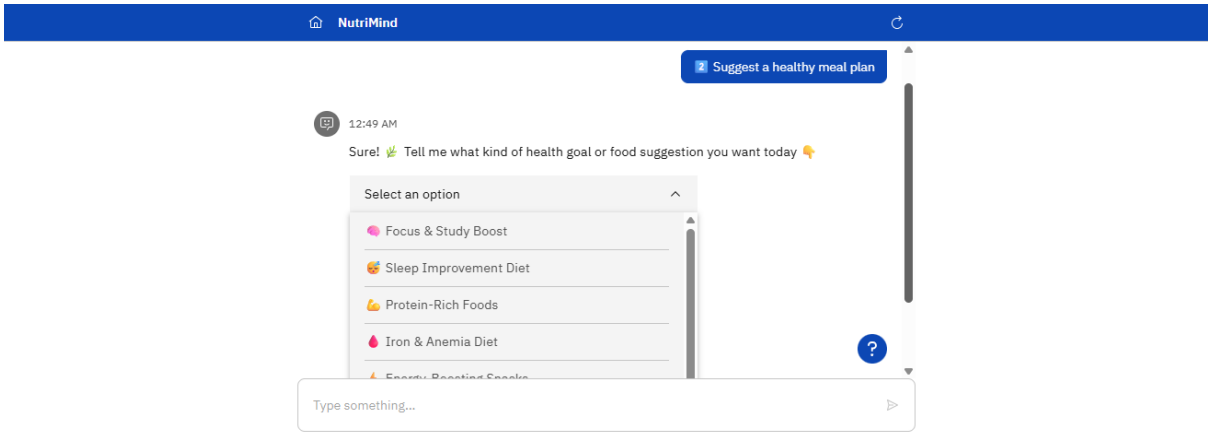
+1 415 523 8886

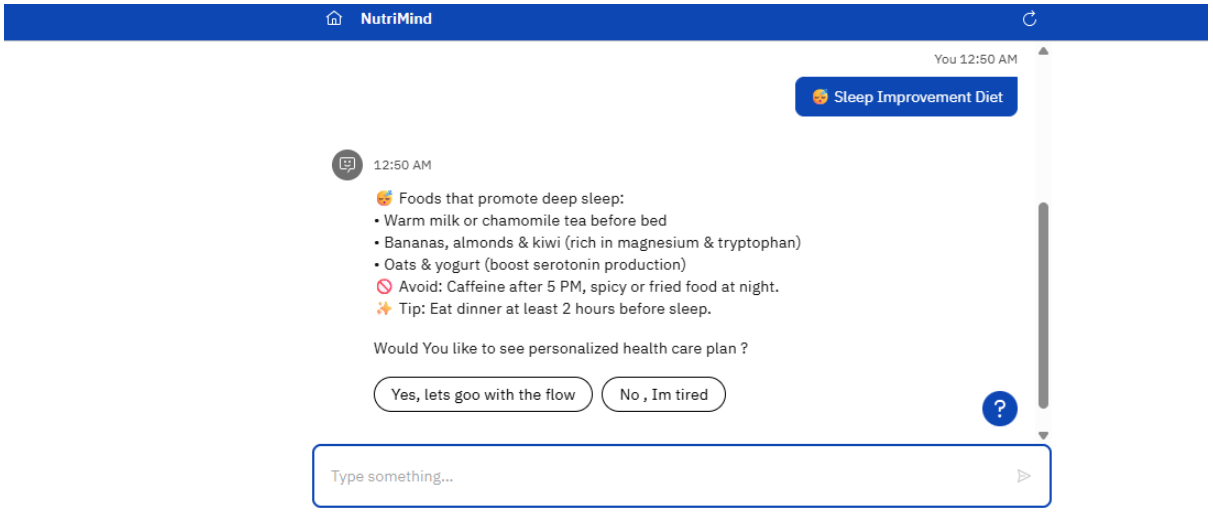
with code **join dead-her**

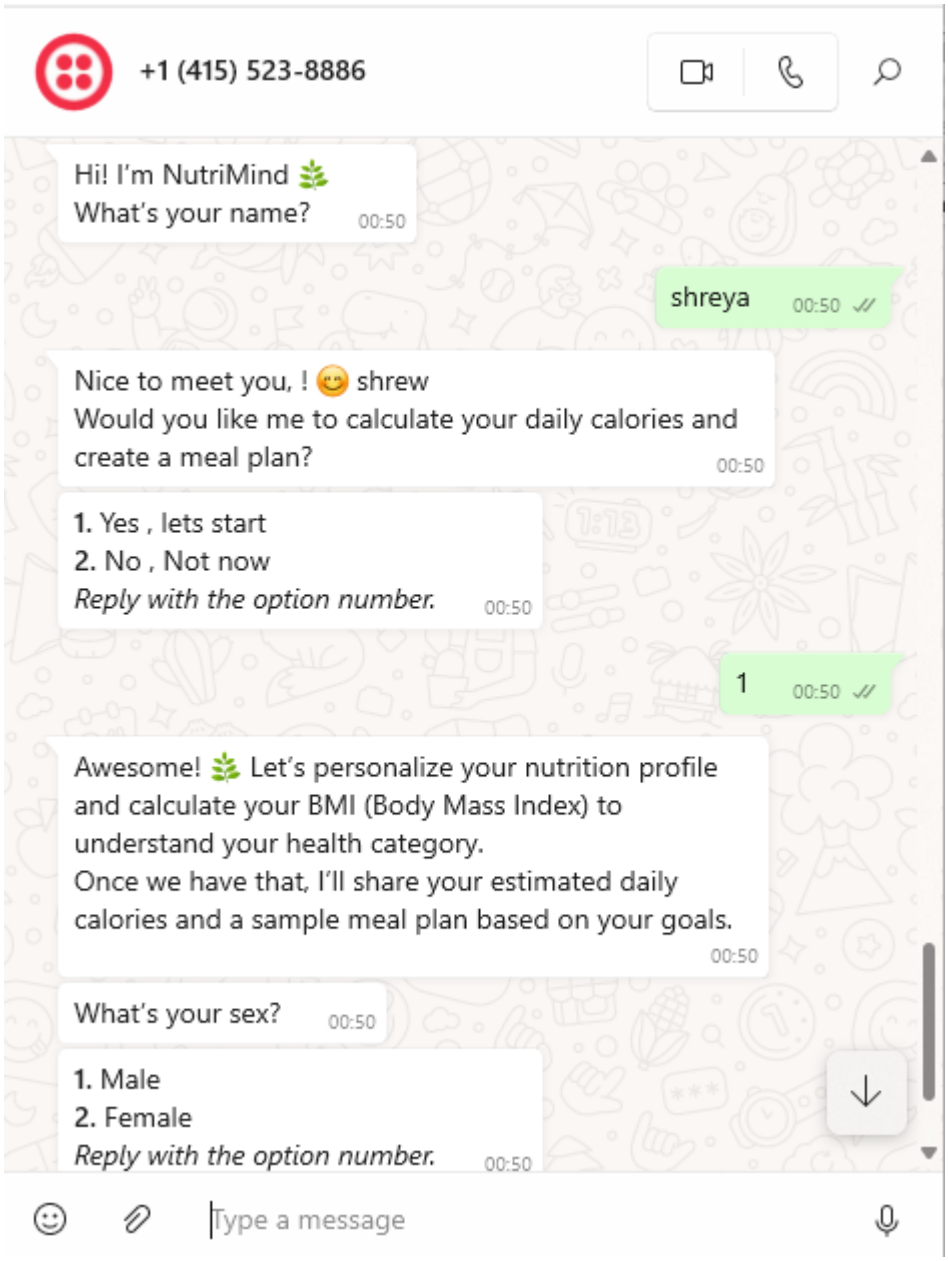
[Open WhatsApp]

7. Output






NutriMind
You 12:50 AM
😴 Sleep Improvement Diet
12:50 AM
😴 Foods that promote deep sleep:
• Warm milk or chamomile tea before bed
• Bananas, almonds & kiwi (rich in magnesium & tryptophan)
• Oats & yogurt (boost serotonin production)
🚫 Avoid: Caffeine after 5 PM, spicy or fried food at night.
✨ Tip: Eat dinner at least 2 hours before sleep.
Would You like to see personalized health care plan ?
Yes, lets goo with the flow
No , Im tired
Type something...


+1 (415) 523-8886
Hi! I'm NutriMind 🌿
What's your name? 00:50
shreya 00:50
Nice to meet you, ! 😊 shrew
Would you like me to calculate your daily calories and create a meal plan? 00:50
1. Yes , lets start
2. No , Not now
Reply with the option number. 00:50
1 00:50
Awesome! 🌿 Let's personalize your nutrition profile and calculate your BMI (Body Mass Index) to understand your health category.
Once we have that, I'll share your estimated daily calories and a sample meal plan based on your goals. 00:50
What's your sex? 00:50
1. Male
2. Female
Reply with the option number. 00:50
Type a message

8. Technical Summary

The chatbot was built using IBM Watsonx Assistant, leveraging Actions and Context Variables for personalization.

BMI calculation was embedded as a dynamic logic step.

All major user intents (diet, health, sleep, energy, etc.) were handled via predefined actions.

Integration with WhatsApp added accessibility to users in real-world scenarios.

Optional LLM integration (Watsonx.ai) allows expansion into more intelligent responses.

9. Key Learnings

Learned how to use IBM Watsonx Assistant to build real conversational workflows.

Understood the structure of chatbot actions, variables, and user intents.

Gained hands-on experience in cloud integration and deployment.

Explored the role of LLMs in improving chatbot intelligence.

Enhanced understanding of nutrition data and personalization through AI.

10. Conclusion

The NutriMind chatbot successfully demonstrates how AI can promote health and nutrition awareness through personalized guidance.

Using Watsonx Assistant and IBM Cloud, an interactive and intelligent system was developed that can assist users with healthy choices.

This project can be extended with machine learning, user tracking, and LLM integration to become a complete digital nutritionist.