
CAPSTONE PROJECT

SMARTEST AI NUTRITION AGENT

Presented By:

1. Nandini Bhanushali – Gandhinagar University (BTech-IT)

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 project aims to build “**The Smartest AI Nutrition Assistant**” using **Generative AI**. Current diet tools lack personalization and adaptability, failing to consider users’ lifestyle, culture, allergies, and health conditions. Dieticians also face challenges in offering tailored advice at scale.

This AI-powered assistant will:

- Understand inputs via **text, voice, or images** (e.g., food photos).
- Generate **personalized meal plans** based on user’s health, fitness, and preferences.
- Offer **contextual explanations** for its suggestions.
- Adapt continuously through user feedback.

PROPOSED SOLUTION

- ◊ Develop a generative AI-powered assistant that delivers personalized and adaptive nutrition guidance. The system will process user inputs via text, voice, or images to create customized meal plans, suggest food swaps, and explain nutritional choices. This intelligent agent bridges the gap between generic diet apps and expert consultation by dynamically adapting to user preferences and health data.
- ◊ Key components:
 - **Data Collection:** Collect user inputs and integrate open dietary databases (e.g., USDA, FDC) via IBM Cloud Object Storage.
 - **Preprocessing:** Clean and standardize health profiles, food preferences, and dietary restrictions.
 - **Model Development:** Use IBM Watson NLP to understand and respond to user input.
 - **Evaluation:** Measure output relevance, personalization quality, and user satisfaction; refine via feedback.

SYSTEM APPROACH

The "System Approach" section outlines the overall strategy and methodology for developing and implementing the AI-powered Nutrition Assistant. Here's a suggested structure for this section:

- ◊ **System requirements:**

- IBM Cloud Lite (mandatory)
- Watsonx.ai for generative AI model development
- Agent Lab (Beta) for building and managing the interactive AI agent
- IBM Cloud Object Storage for storing user profiles, nutrition datasets, and meal plans

ALGORITHM

- The agent uses **LLMs (Large Language Models)** via **Watsonx.ai** to process user inputs and generate personalized responses.
- **Data Input:**
 - Inputs include **user profile details** (e.g., age, goals, medical conditions, allergies), **dietary preferences**, and feedback.
 - The agent also considers text-based user queries (e.g., “Suggest a protein-rich vegetarian lunch”).
- **Training Process:**
 - No custom training was done; however, **prompt engineering** and **agent logic configuration** were used in Agent Lab (beta) to tailor responses and guide the agent’s behavior.
- **Prediction Process:**
 - The model dynamically generates nutrition plans and explanations in real-time based on user queries.
 - Responses are personalized using the context saved in the agent’s memory and fine-tuned via user feedback.

DEPLOYMENT

The screenshot shows the IBM WatsonX Deployment Spaces interface. At the top, there's a navigation bar with 'IBM watsonx' on the left, followed by 'Upgrade', a help icon, and user information 'Nandini Bhanushali's Acco...'. To the right are dropdowns for 'London' and 'NB', and a grid icon. Below the navigation is a breadcrumb path 'Deployment spaces /' and a search bar.

The main area is titled 'NutritionAgent_deploy1'. It has tabs for 'Overview', 'Assets', 'Deployments' (which is selected), and 'Jobs'. Under 'Deployments', there's a table with columns: Name, Type, Status, Asset, Asset type, Tags, and Last modified. One row is visible:

Name	Type	Status	Asset	Asset type	Tags	Last modified
Smallest AI Nutrition Assistant	Online	Deployed	Smallest AI Nutrition Assistant	AI service	wx-agent	1 minute ago Nandini Bhanushali (You)

At the bottom, there are pagination controls: 'Items per page: 20', '1-1 of 1 items', '1 of 1 pages', and navigation arrows.

RESULT

IBM watsonx

Upgrade ? Nandini Bhanushali's Acc... London NB

Deployment spaces / NutritionAgent_deploy1 / Smartest AI Nutrition Assistant /

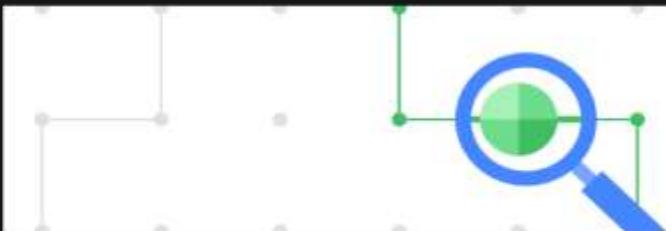
Smartest AI Nutrition Assistant • Deployed • Online

API reference Test Preview New chat +

Smartest AI Nutrition Assistant 04:02 PM

Welcome to Smartest AI Nutrition Assistant

To provide guidance of nutrition to the users as per their preferences.



Hie, I'm Nandini ➤

About this deployment

Name: Smartest AI Nutrition Assistant

Description: To provide guidance of nutrition to the users as per their preferences.

Deployment Details

Deployment ID: d09bfcdc1-b3f8-44...
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

Associated asset

Smartest AI Nutrition Assistant
bed9a2ab-b79c-44b1-8991-c468144d68ed

RESULT

The screenshot shows the IBM WatsonX interface with the following details:

- Deployment spaces / NutritionAgent_deploy1 / Smartest AI Nutrition Assistant**
- Status:** Deployed (green), Online
- Preview:** Selected tab.
- Chat History:**
 - Smartest AI-Nutrition Assistant 04:03 PM: Hello Nandini! It's nice to meet you. I'm your nutrition agent, and I'm here to help you with all your nutrition-related queries. Before we begin, could you please tell me a bit about yourself? What's your age, and do you have any food preferences or medical history I should know about? Also, which city are you from? This information will help me provide you with personalized advice and guidance.
 - Please respond with the following details:
 1. Age
 2. Food preferences (e.g. vegetarian, non-vegetarian, etc.)
 3. Medical history (if any)
 4. CityI'll be happy to assist you once I have this information!
 - ▶ How did I get this answer?
- About this deployment:**
 - Name:** Smartest AI Nutrition Assistant
 - Description:** To provide guidance of nutrition to the users as per their preferences.
 - Deployment Details:**
 - Deployment ID: d89bfac1-b3f8-44...
 - 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:** ws-agent
 - Associated asset:** Smartest AI Nutrition Assistant
bed9a2ab-b79c-44b1-8991-c468144d68ed

RESULT

IBM watsonx

Deployment spaces: / NutritionAgent_deploy1 / Smartest AI Nutrition Assistant /

Smartest AI Nutrition Assistant Deployed Online

API reference Test Preview

You 04:07 PM
I'm 21 and vegetarian. I have kidney stone issues and want to gain weight; can you generate meal-plans and suggest yoga & exercises?

Smartest AI Nutrition Assistant 04:07 PM
Based on the search results, here are some suggestions for a vegetarian meal plan that can help with kidney stone issues and weight gain:

1. Eat a balanced diet that includes plenty of fruits, vegetables, whole grains, and lean protein sources.
2. Include foods that are rich in calcium, such as dark leafy greens, fortified plant-based milk, and tofu, to help prevent kidney stones.
3. Choose foods that are low in oxalate, such as bananas, melons, and cucumbers, to help reduce the risk of kidney stones.
4. Drink plenty of water to help flush out toxins and prevent kidney stones.
5. Consider consulting with a registered dietitian or a healthcare professional to create a personalized meal plan that meets your specific needs and health goals.

Additionally, here are some yoga and exercise suggestions that can help with weight gain and overall health:

1. Practice yoga poses that can help improve digestion and reduce stress, such as child's pose, downward-facing dog, and

Type something... Send

About this deployment

Name: Smartest AI Nutrition Assistant

Description: To provide guidance of nutrition to the users as per their preferences.

Deployment Details

Deployment ID: d09b1dc1-b3f8-44...
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

Associated asset

Smartest AI Nutrition Assistant
bed9a2ab-b79c-44b1-8991-c468144d68ed

Last modified: 1 minute ago
Created on: Jul 31, 2025

IBM WatsonX

Deployment spaces: / NutritionAgent_deploy1 / Smartest AI Nutrition Assistant /

Smartest AI Nutrition Assistant Deployed Online

API reference Test Preview

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bed9a2ab-b79c-44b1-8991-c468144d68ed

Last modified: 1 minute ago
Created on: Jul 31, 2025

CONCLUSION

- The Smartest AI Nutrition Assistant demonstrates how **Generative AI** can revolutionize personalized health and dietary guidance. By leveraging IBM Cloud Lite services, Watsonx.ai, and Agent Lab (Beta), the system provides **real-time, context-aware, and individualized nutrition recommendations** based on user input.
- This intelligent assistant successfully bridges the gap between generic diet apps and expert counseling, offering adaptability, continuous learning, and deeper personalization. It not only enhances user engagement but also supports healthier lifestyle decisions by providing meaningful explanations and meal planning aligned with users' goals and preferences.
- Overall, the project highlights the potential of AI-driven health solutions in delivering **scalable, accessible, and expert-level nutrition support**.

FUTURE SCOPE

- In the future, the AI Nutrition Assistant can be enhanced by incorporating image-based food recognition.
- It can be integrated with wearable devices for real-time health tracking.
- It supports multiple languages to increase accessibility.
- Additionally, the system can offer progress dashboards, enable expert collaboration, and be scaled for use in healthcare, fitness, and wellness platforms.

REFERENCES

- IBM Cloud Documentation – <https://cloud.ibm.com/docs>
- Watsonx.ai Overview – <https://www.ibm.com/products/watsonx>
- Agent Builder (Beta) Documentation – <https://dataplatform.cloud.ibm.com>
- WHO – Nutrition Facts and Guidelines – <https://www.who.int/health-topics/nutrition>
- Generative AI in Healthcare: Opportunities and Challenges (Research Article)
- Nutrition and Dietetics Resources (Open Government Datasets)
- Credly Certificates – IBM Getting Started with AI, Journey to Cloud, and RAG Lab

IBM CERTIFICATIONS

In recognition of the commitment to achieve professional excellence



Nandini Bhanushali

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence



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Completion Certificate



This certificate is presented to
NANDINI BHANUSHALI

for the completion of

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(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 24 Jul 2025 (GMT)

Learning hours: 20 mins



THANK YOU