
CAPSTONE PROJECT

NutriXpert – AI-Powered Personalized Nutrition Assistant

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OUTLINE

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PROBLEM STATEMENT

In today's health-conscious world, individuals are actively seeking personalized nutrition guidance. However, most existing apps offer generic diet plans, fail to adapt in real-time, and overlook crucial aspects like cultural preferences, allergies, lifestyle, and medical history. At the same time, dietitians face difficulty scaling 1:1 consultations due to time and resource constraints.

Proposed Solution:

We propose NutriXpert, an AI-powered virtual nutrition assistant built using IBM Granite and Cloud Lite services. It uses Generative AI, NLP, and multimodal input (text, voice, image) to deliver personalized meal plans, smart food swaps, and contextual nutrition advice. NutriXpert adapts continuously to user feedback and health goals, bridging the gap between generic diet apps and expert guidance.

TECHNOLOGY USED

- **IBM Granite Foundation Model** – for generative AI and reasoning
- **IBM Cloud Lite Services** – a platform for hosting and data storage
- **Watsonx.ai Studio** – to build, train, and deploy the AI agent
- **Natural Language Processing (NLP)** – to understand user input in text or voice
- **Multimodal Understanding** – to process images like food photos or grocery labels
- **Vector Indexing with RAG** – Enables retrieval of relevant nutrition info from uploaded PDFs using semantic search.

IBM CLOUD SERVICES USED

- IBM Cloud Watsonx AI Studio
- IBM Cloud Watsonx AI runtime
- IBM Cloud Agent Lab
- IBM Granite foundation model

WOW FACTORS

NutriXpert isn't just a diet app — it's a smart, adaptive, and empathetic nutrition companion. Combining cutting-edge AI with real-world health needs delivers deeply personalized guidance that evolves with the user.

Key Innovations:

- **Culturally Adaptive Meal Plans:** Recommends region-specific meals based on lifestyle and traditions.
- **Dynamic Learning:** Adapts diet suggestions in real time based on health changes and user feedback.
- **Contextual Explanations:** Clearly explains “why” one food is better than another based on user goals.
- **Allergy & Condition-Aware:** Avoids foods based on allergies, medical conditions, and personal restrictions.
- **Beyond Calories:** Focuses on micronutrients, smart swaps, and holistic well-being.

END USERS

- Health-conscious individuals
- Fitness enthusiasts
- Wellness app developers
- Students and professionals
- Healthcare providers
- Dietitians and nutritionists
- People with medical conditions

RESULTS

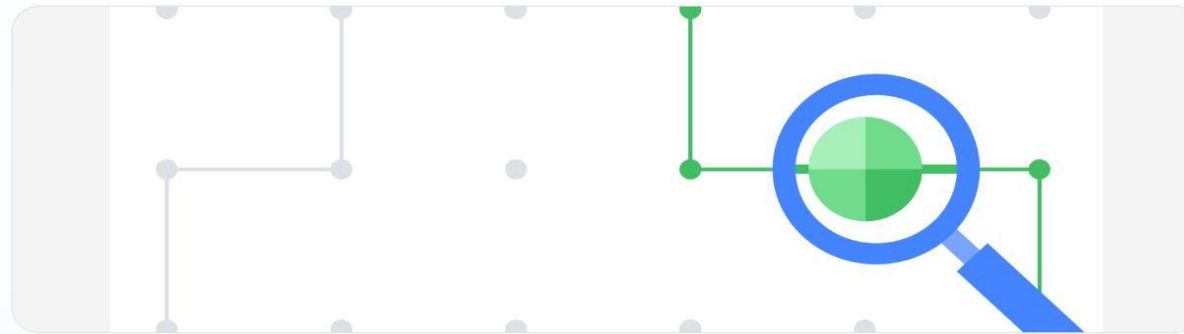
Agent preview



NutriXpert - Your AI Nutrition Assistant 07:16 PM

Welcome to NutriXpert - Your AI Nutrition Assistant

Your AI nutritionist: personalized, culturally aware, and health-goal-driven meal guidance.



Sample questions

Suggest a high-protein vegetarian breakfast.



Give me a diet plan without dairy or gluten.



Why is brown rice better than white rice?



What's wrong with eating chips every day?




Type something...




RESULTS

Agent preview

 You: 07:20 PM

What's wrong with eating chips every day?

 NutriXpert - Your AI Nutrition Assistant 07:20 PM

While chips can be part of a balanced diet in moderation, eating them every day can pose several nutritional concerns. Most chips are high in sodium, unhealthy fats, and calories, but low in essential nutrients like fiber, protein, and vitamins. This can contribute to weight gain, high blood pressure, and an increased risk of heart disease over time. It's generally recommended to consume a variety of foods to meet your nutritional needs. If you're looking for a snack, consider healthier alternatives like carrot sticks with hummus, air-popped popcorn, or a small handful of nuts.

► **How did I get this answer?**



Type something...



RESULTS

Deployed AI Agent



You: 07:18 PM

Suggest a high-protein vegetarian breakfast.



NutriXpert - Your AI Nutrition Assistant 07:18 PM

For a high-protein vegetarian breakfast, consider a tofu scramble with mixed vegetables. Here's a simple recipe:

Ingredients:

- 1 block (14 oz) of firm tofu, drained and crumbled
- 1 tablespoon olive oil
- 1/2 cup diced bell peppers
- 1/2 cup diced onion
- 1 clove garlic, minced
- 1/2 cup diced spinach
- 1/4 cup chopped tomatoes
- Salt and pepper to taste
- Optional: nutritional yeast for a cheesy flavor

Instructions:

1. Heat the olive oil in a pan over medium heat.
2. Add the onion, bell pepper, and garlic, sauté until the onion becomes translucent.
3. Add the crumbled tofu, spinach, and tomatoes. Cook for about 5 minutes, stirring occasionally.
4. Season with salt, pepper, and nutritional yeast if using.

Type something...



CONCLUSION

- NutriXpert provides intelligent, personalized nutrition guidance using IBM Generative AI.
- Automates meal planning, food suggestions, and nutrition explanations.
- Saves time by adapting to user preferences, allergies, and health goals.
- Enhances decision-making in daily diet and lifestyle choices.
- Bridges the gap between generic diet apps and real nutrition experts.
- Promotes healthier living through AI-powered, data-driven personalization.

FUTURE SCOPE

- Integration with wearable devices
- Multilingual Support for diverse users and regional diets
- Recipe generation
- Grocery list creation
- Deeper medical integration

GITHUB LINK

- <https://github.com/SrushtiPatel4900/NutriXpert-AI-Powered-Personalized-Nutrition-Assistant.git>

IBM CERTIFICATIONS

- Credly certificate – Getting started with AI




IBM Certifications

- Lab-RAG with LangChain - Certificate

IBM SkillsBuild

Completion Certificate



This certificate is presented to

Srushti Patel

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

IBM CERTIFICATIONS

- credly certificate – Journey to Cloud

In recognition of the commitment to achieve professional excellence



Srushti Patel

Has successfully satisfied the requirements for:

Journey to Cloud: Envisioning Your Solution



Issued on: Jul 21, 2025
Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/146a0a81-fc95-4a3a-a025-b8d3b4e97985>





THANK YOU