**Hackathon Project Phases** project.**Template** for the **GEMINI-AI**

# **Hackathon Project Phases Template**

## **Project Title:**

**Advancing Nutrition Science Through Gemini-Ai**

## **Team Name:**

"NutriTech Innovators"

## **Team Members:**

* D.Sumanth
* N.Rohith
* Ch.Harish

## **Phase-1: Brainstorming & Ideation**

### **Objective:**

Gemini-AI provides detailed nutritional information and personalized meal plans using Google Generative AI. It helps users make informed dietary choices based on their preferences, health conditions, and nutritional needs.

### **Key Points:**

1. **Problem Statement:**

A web-based application designed to provide users with detailed nutritional information about various food items. By leveraging Google Generative AI, the application delivers instant, comprehensive data on macronutrients (protein, fat, carbohydrates), micronutrients (vitamins, minerals), and calorie content. This tool aims to assist individuals in making informed dietary choices and understanding the nutritional value of the foods they consume

**Proposed Solution:**GeminiAI is a web app that provides accurate nutritional data for food items. It creates personalized meal plans based on user preferences, health conditions, and dietary needs. This helps users make healthier and more informed eating choices.

**Target Users:**

1.People with specific dietary needs or restrictions (e.g., allergies, diabetes, etc.)

2.Fitness enthusiasts

3.Individuals looking to improve their eating habits

4.Users seeking personalized nutritional guidance and meal planning

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1. **Expected Outcome:**

 Users will make informed, healthier dietary choices based on accurate nutritional data.

 Personalized meal plans will help individuals meet their dietary goals, manage health conditions, and maintain a balanced lifestyle.

 Increased awareness of the nutritional value of food items will lead to improved eating habits..

## **Phase-2: Requirement Analysis**

### **Objective:**

Define the technical and functional requirements for the Gemini-Ai.

### **Key Points:**

1. **Technical Requirements:**
   * Programming Language: **Python**
   * Backend: **Google Gemini Flash API**
   * Frontend: **Streamlit Web Framework**

Gemini-Ai/chartgpt……

**2.Functional Requirements:  
1.User Profiles:** Allow users to create and manage profiles with details like health conditions, dietary restrictions, and preferences.

1. **Nutritional Data Search:** Users can search for foods and get detailed nutritional information, including calories and nutrients.
2. **Personalized Meal Plans:** Generate weekly meal plans based on user preferences, health needs, and dietary goals.
3. **Grocery List Creation:** Automatically generate grocery lists based on meal plans, which users can modify and save.
4. **Food Tracking & Progress:** Enable users to log daily food intake, track their nutritional goals, and get AI-based meal recommendations.
5. **Constraints & Challenges:**
   * Data Accuracy and Coverage
   * Personalization Complexity.
   * User Engagement and Retention:
   * Integration with External Services

## **Phase-3: Project Design**

### **Flow chart of the development steps in creating the nutrition curriculum for undergraduate medical education. MLA, medical licensing assessment.Objective:**

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### **Key Points:**

1. **System Architecture:**\*Frontend (User Interface Layer)

\*Backend (Server-Side Logic)

\*Third-Party Integrations:

**2.User Flow:** **Sign Up / Login:** Users create an account or log in, providing basic details and setting up a personalized profile (health goals, preferences, dietary restrictions).

 **Meal Plan Generation:** Based on the profile, the app generates a customized meal plan with recipes, nutritional info, and serving sizes.

 **Food Logging & Progress Tracking:** Users log their meals, track daily nutrient intake, and receive AI recommendations for adjusting their diet.

 **Grocery List & Notifications:** The app generates a grocery list for the meal plan, sends reminders for meal prep, and provides progress updates.

1. **UI/UX Considerations:**
   * **Minimalist, user-friendly interface** for seamless navigation.
   * **Filters for price, mileage, and features**.
   * **Dark & light mode** for better user experience.

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## **Phase-4: Project Planning (Agile Methodologies)**

### **Objective:**

Break down development tasks for efficient completion.

| **Phase** | **Tasks/Activities** | **Duration** | **Assigned Roles** | **Outcomes/Deliverables** | **Gemini AI Integration** |
| --- | --- | --- | --- | --- | --- |
| **1. Product Backlog Creation** | - Define project scope based on nutrition science needs. - Collect and analyze data from health studies, journals, and datasets. | 1 week | Product Owner, Data Analysts | - Product Backlog with nutrition-focused features - Prioritized user stories | Use Gemini AI to analyze vast amounts of nutrition data and trends. |
| **2. Sprint Planning** | - Identify key sprint goals (research, diet modeling, AI algorithm validation). - Break down backlog items into actionable tasks. | 2 days | Scrum Master, Product Owner | - Sprint Goal - Sprint Backlog with tasks | Leverage Gemini AI to optimize task prioritization based on data analytics. |
| **3. Sprint Execution (Development)** | - Implement AI-powered nutritional algorithms (e.g., personalized diets). - Develop data models using Gemini AI. - Perform real-time nutritional analysis. | 2-3 weeks | Developers, Nutrition Experts | - Functional prototypes - AI nutrition model | Gemini AI assists in dynamic dietary recommendations based on real-time data. |
| **4. Testing & Validation** | - Test AI model for accuracy in predicting nutrition-related outcomes. - Perform A/B testing on diet recommendations. | 1 week | QA Testers, Nutrition Scientists | - Validated AI Nutrition Model - Performance Reports | Gemini AI helps analyze test results and adjust models for better predictions. |
| **5. Review & Feedback** | - Review AI-generated nutrition recommendations with stakeholders. - Gather feedback for improvements. | 3 days | Product Owner, Scrum Master | - Sprint Review Meeting - Feedback List | Gemini AI can highlight areas of improvement based on user interaction data. |
| **6. Retrospective** | - Reflect on sprint’s progress, challenges, and opportunities for improvement. | 1 day | Scrum Master, Team | - Retrospective Report with Actionable Insights | Gemini AI can provide analytics on sprint efficiency, suggesting optimizations. |
| **7. Continuous Delivery** | - Iteratively improve AI model and features based on ongoing research and feedback. - Regular updates to nutrition algorithms. | Ongoing | Developers, Product Owner | - Updated AI-powered nutrition platform | Continuous integration of new data into Gemini AI for up-to-date recommendations. |

### **Sprint Planning with Priorities**

### **Sprint 1 – Setup & Integration (Day 1)**

**(🔴 High Priority)** Set up the **environment** & install dependencies.  
 **(🔴 High Priority)** Integrate **Google Gemini API**.  
 **(🟡 Medium Priority)** Build a **basic UI with input fields**.

### **Sprint 2 – Core Features & Debugging (Day 2)**

**(🔴 High Priority)** Implement **search & comparison functionalities**.  
 **(🔴 High Priority)** Debug API issues & handle **errors in queries**.

### **Sprint 3 – Testing, Enhancements & Submission (Day 2)**

**(🟡 Medium Priority)** Test API responses, refine UI, & fix UI bugs.  
 **(🟢 Low Priority)** Final **demo preparation & deployment**.

## **Phase-5: Project Development**

### **Objective:**

Implement core features of the Gemini Ai.

### **Key Points:**

1. **Technology Stack Used:**
   * **Frontend:** Streamlit
   * **Backend:** Google Gemini Flash API
   * **Programming Language:** Python
2. **Development Process:**
   * Implement **API key authentication** and **Gemini API integration**.
   * Develop **vehicle comparison and maintenance tips logic**.
   * Optimize **search queries for performance and relevance**.
3. **Challenges & Fixes:**
   * **Challenge:** Delayed API response times.  
      **Fix:** Implement **caching** to store frequently queried results.
   * **Challenge:** Limited API calls per minute.  
      **Fix:** Optimize queries to fetch **only necessary data**.

## **Phase-6: Functional & Performance Testing**

### **Objective:**

| **Testing Type** | **Objective** | **Activities** | **Tools/Methods** | **Duration** | **Outcome/Deliverable** |
| --- | --- | --- | --- | --- | --- |
| **1. Functional Testing** | Ensure features work as expected | Test each function (e.g., nutrition recommendations, diet plans) | Manual testing, Unit testing, Test scripts | 1-2 weeks | Pass/Fail results for each feature |
| **2. Test Case Design** | Develop test cases for expected functionality | Create detailed test cases for every feature and user flow | Test Case Management Tools | 2-3 days | Test Case Documentation |
| **3. Performance Testing** | Evaluate system’s ability to handle load and stress | Simulate high user load, stress, and response time testing | Load testing, Stress testing, JMeter | 1 week | Performance Metrics (response time, load) |
| **4. Load Testing** | Assess system’s stability under normal load | Simulate typical user activity and analyze performance | JMeter, LoadRunner | 1-2 weeks | Load Testing Results (scalability) |
| **5. Stress Testing** | Identify system behavior under extreme load or failure | Test limits of the system under excessive load conditions | Apache JMeter, Performance Monitor | 3-4 days | Stress Test Results (system breakdown points) |

Ensure that the Gemini-Ai works as expected.

## **Final Submission**

1. **Project Report Based on the templates**
2. **GEMINI**-AI
3. **Presentation**