

system design document

HEALTHPAL



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Saint Charles community college

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## **INTRODUCTION**

The **HealthPal** application is a health monitoring tool designed to assist users in tracking their essential health metrics, setting wellness goals, and receiving personalized AI-driven health recommendations. Maintaining a healthy lifestyle in today’s fast-paced environment is increasingly challenging, and **HealthPal** aims to bridge this gap by leveraging technology to promote health awareness and proactive informed decision-making. The app will be developed as a user-friendly platform thatprovides users with the tools they need to take control of their health in a simple, user-friendly manner

## **PURPOSE**

The purpose of the **HealthPal** monitoring Application is to provide a comprehensive yet straightforward tool for users to log, track, and visualize their health data at a glance. By offering AI-driven insights and personalized recommendations, the app aims to help users monitor their health metrics, understand their health habits and promote healthier lifestyles. Additionally, HealthPal serves as a carry-on digital companion, bridging the gap between daily self-care and long-term goals while fostering greater awareness and accountability in managing personal well-being.

## **SYSTEM OVERVIEW**

HealthPal combines intuitive user interfaces, real-time data processing, and AI-driven recommendations to deliver personalized health tips. The system is built on a mobile application using Android Studio, with Java as the primary programming language. It integrates with APIs, including Google sign-in for authentication, the Open Food Facts API for nutritional data, and OPEN AI GPT for AI-driven personalized health tips and recommendations. The backend will be powered by a SQL server database to store user profiles, health metrics, and calorie logs. An API connects the frontend to the backend, enabling secure and efficient data exchange. The app will have an interactive dashboard for users to visualize their progress and get a more complete picture of their health journey alongside customizable reports that can be exported for their personal use and/or shared with their healthcare providers and fitness coach.

## **DESIGN CONSTRAINTS**

1. Platform Limitation: The app is designed for Android devices, thereby limiting access for iOS or other platforms
2. Resource Constraints: Reliance on external APIs like Open Food Facts and OpenAI GPT requires consistent connectivity and may be impacted API availability
3. Performance Concerns: Handling large data sets like logs and nutritional data and generating AI recommendations in real-time might app performance, especially with limited processing power
4. User Interface Limitations: The design must be intuitive and accommodate users with varying levels of technical expertise while fitting within the constraints of mobile screen sizes

## **ROLES AND RESPONSIBILITIES**

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## **PROJECT REFERENCES**

* Google Android Studio Developer Guide

(<https://developer.android.com/identity/sign-in/credential-manager-siwg>)

* Open Food Facts guide

<https://world.openfoodfacts.org/data>

* OpenAI Guide

<https://platform.openai.com/docs/quickstart>

## **SYSTEM ARCHITECTURE**

**Hardware**

1. Developer Personal Computer

* Specifications: A computer with at least 8GB RAM, 4-core Processor, and 500GB storage

1. Mobile Devices

* Specifications: Android smartphones or tablets for testing and debugging the app on actual devices to ensure compatibility and performance

**Software:**

* Java
* Android Studio and required Libraries
* Git
* SQL Server
* Google login API
* Open Food Facts API
* OpenAI API

In addition, team makes use of Zoom and Outlook for communications and meetings.

## **DATABASE DESIGN**

The database will house *user’s table* which will store user information including unique user id, email address and name. The database will also contain the *health metrics* table which is the table that holds the inputted user metrics including weight, user-id, sleep hours, temperature and more. Lastly, the *calorie logs* table will be used to track users calorie intake including the food type, carbohydrate, proteins, fiber, vitamins and more. The breakdown of nutritional contents contained in the logged food helps in generating a more precise and personalized health tips and recommendations.

Note: Please refer to the Database Design Document in Phase 2 folder to a full list of the tables and the fields in each table.

## **HARDWARE AND SOFTWARE DETAILED DESIGN**

**Hardware**

User hardware is any computer with the ability to connect to the internet and have the capacity to host the software and technology that will be used for the project. Each team member will install the necessary application and software in their personal computer.

**Software**

Java is the language supported by Android Studio, which is the primary IDE for designing coding, and debugging the mobile app. SQL server is the database management system used for storing user profiles, health metrics, and calorie logs. Open Food Facts API provides access to nutritional data for food items logged by the user and OpenAI API will power the AI-driven recommendations by analyzing health data and then generating personalized tips. Google sign-in API facilitates user authentication. Git is used to track code changes, enables collaboration, and ensure app management during development.

## **SYSTEM SECURITY AND INTEGRITY CONTROLS**

The main system security and integrity controls will be hosted with google, as the application will use the Google authentication services API to verify each user.

SPONSOR ACCEPTANCE

Approved by the Project Sponsor:

Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

<Faculty Sponsor>

<Faculty Sponsor Title>