

Calora

Intelligent Calorie & Health Management System

Project Proposal

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A privacy-first, secure-by-design mobile platform for nutrition tracking, activity monitoring, and AI-powered recommendations.

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Executive Summary

Calora is an intelligent, privacy-first mobile application that helps users manage daily nutrition and physical activity, and achieve personalized health goals. It combines frictionless data entry (search, barcode, receipt/menu vision) with AI-driven insights while adhering to secure-by-design principles.

1. Project Objectives

- Enable accurate tracking of calories and macronutrients.
- Provide personalized recommendations powered by AI.
- Deliver an intuitive UX for meal/activity logging.
- Incorporate computer vision for receipt/menu understanding.
- Embed strong privacy, transparency, and security throughout.

2. System Overview

Calora follows a modular, layered architecture:

1. **Presentation Layer** — onboarding, dashboards, logging, analytics.
2. **Application Layer** — services for goals, meals, activities, recommendations, notifications.
3. **Domain Layer** — entities: User, Meal, Food, Activity, DailyLog, Recommendation, Subscription.
4. **Data Layer** — persistence, repositories, external APIs (nutrition DBs, barcode, OCR).

3. User Flow and Functional Capabilities

Onboarding & Login. Users register (email/social), enter age/gender/height/weight/activity level, and select a goal (lose/maintain/gain). Calora computes daily calorie and macro targets.

Dashboard. Shows calories consumed/burned/remaining, macro progress, and quick actions (add meal, scan barcode, log activity, view insights).

Meal & Food Logging. Search verified foods, scan barcodes, add custom recipes, or use AI photo recognition (premium). Entries update the DailyLog in real time.

Activity Tracking. Log workouts manually or sync from devices; compute burned calories and net balance.

Recommendations & Insights. AI highlights macro gaps, suggests alternatives, and nudges toward daily balance.

Progress & History. Charts for calorie trends, macro adherence, and weight trajectory.

Notifications. Meal reminders, hydration alerts, and streaks.

Premium Features. AI meal recognition, weekly meal plans, advanced analytics, ad-free experience with cloud backup/sync.

4. System Modules

- **User Management** — auth, profiles, subscriptions.
- **Goal Management** — BMR/TDEE & targets.
- **Meal Tracking** — foods, nutrition calc, daily totals.
- **Activity Tracking** — workouts, burned kcal.
- **Recommendation Engine** — adaptive nutrition insights.
- **Notification System** — reminders & alerts.
- **Analytics** — reports and visualizations.
- **Premium Services** — AI vision, plans, advanced reports.

5. Simplified Domain Model

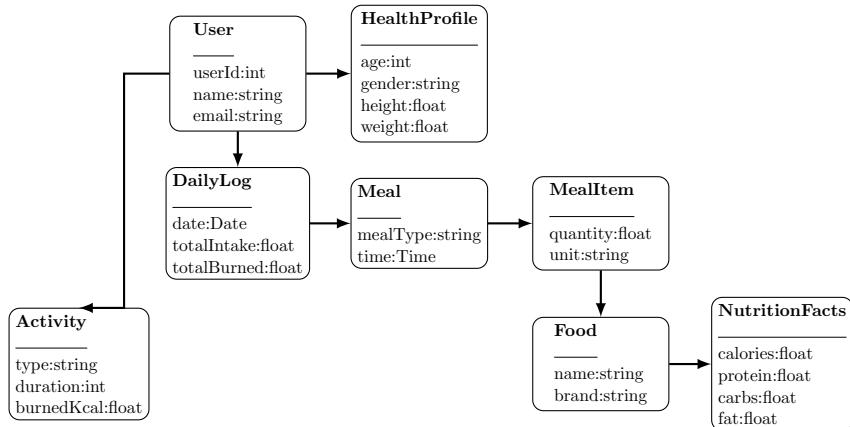


Figure 1: Simplified Domain Model for Calora

6. Non-Functional Requirements

- **Performance** — fast search, low-latency feedback.
- **Usability** — clean, accessible UI.
- **Scalability** — large DBs and AI workloads.
- **Availability** — offline-first with sync.
- **Security & Privacy** — core priorities across modules.

7. Trust and Data Protection Framework

7.1. Privacy-First Design

- **User Consent and Control** — granular consent; Privacy Dashboard for view/export/delete.
- **Data Minimization & Purpose Limitation** — collect only what is needed.
- **Privacy by Default** — sharing features are opt-in.
- **Transparency** — clear policy on data use and sharing.
- **Retention** — inactive accounts (e.g., 24 months) anonymized/deleted after notice.

7.2. Secure-by-Design

- **Threat Modeling** — early identification of risks.
- **TLS 1.3 in Transit, AES-256 at Rest** — end-to-end encryption.

- **MFA & Least Privilege** — strong auth and scoped access.
- **Secure SDLC** — SAST/dep scanning in CI/CD.
- **API Security** — rate limiting, validation, monitoring.
- **Audits/PenTests & Bug Bounty** — continuous hardening.
- **Incident Response** — detect, contain, notify, recover.

8. Project Team and Responsibilities

Backend Developer APIs, database schema, integrations, security headers/HSTS, Cloudflare (Full Strict).

Frontend Developer Mobile UI/UX, barcode/receipt/menu scan flows, offline cache, accessibility.

AI/Recommendation Engineer Nutrition inference, barcode sanity checks/learning pipeline, OCR/NLP (on-device where possible), ranking heuristics.

9. Conclusion

Calora unites frictionless logging, AI insights, and rigorous privacy/security to deliver a modern health companion. Next steps: detailed sequence diagrams, API contracts, and a sprint plan for MVP (barcode + logging + basic insights) followed by vision features and premium analytics.