CravesByIb

Ai-powered Meal Recommendation & Automation Platform

1. Executive Summary

CravesByIb is an AI-powered food recommendation and meal-planning platform designed to help users decide **what food to prepare** based on their **available ingredients, budget constraints, and nutritional preferences**. The platform begins as a decision-support system and evolves into an **AI-automated food-intelligence product that optimises** user choices, business workflows, and operational efficiency.

The long-term vision is to transform CravesByIb into an **intelligent food operating system** that combines recommendation, nutrition reasoning, cost awareness, and automated business flows.

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2. Problem Statement

Modern households and individuals face a recurring problem:

- They have ingredients, but do not know what to cook
- They have a limited budget
- They want meals aligned with nutritional or dietary goals

Existing solutions are either:

- Recipe-centric without ingredient feasibility
- Nutrition-focused without cost awareness
- Static and non-personalised

CravesByIb addresses this gap by providing **context-aware meal recommendations** grounded in real constraints.

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3. Product Objectives

Primary Objectives

- Recommend meals that users can realistically prepare
- Minimise food waste by leveraging available ingredients
- Respect user budget and nutritional constraints

Secondary Objectives

- Learn from user behaviour over time
- Automate food decision workflows
- Enable future integrations (vendors, nutrition plans, smart kitchens)

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4. Target Users

Primary Users

- Individuals cooking at home
- Budget-conscious households
- Health-aware users

Secondary Users (Future)

- Meal prep services
- Nutrition coaches
- Food content brands

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5. Core System Capabilities (MVP)

5.1 User Input Handling

Users provide:

- Ingredients available (type & quantity)
- Budget limit
- Nutritional preferences or restrictions

5.2 Meal Recommendation Engine

- Filters feasible recipes
- Scores recipes based on ingredient match, cost, and nutrition
- Ranks and presents top recommendations

5.3 Explainability

Each recommendation includes:

- Why it was selected
- What ingredients are missing (if any)
- Nutritional summary

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6. Data Model & Schema Overview

6.1 Ingredient

Stores atomic food components with cost and nutrition metadata.

6.2 Recipe

Represents cookable meals and preparation metadata.

6.3 Recipe—Ingredient

Defines required ingredients and quantities per recipe.

6.4 User

Stores dietary context and preferences.

6.5 User—Pantry

Tracks ingredients currently available to the user.

6.6 Nutrition—Preferences

Explicit nutritional constraints.

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7. Recommendation Logic (MVP)

Step 1: Constraint Filtering

- Remove recipes violating allergies or diet
- Remove recipes exceeding budget

Step 2: Feasibility Scoring

- Ingredient match ratio

- Missing ingredient cost

Step 3: Nutrition Alignment

- Distance from calorie and macronutrient targets

Step 4: Ranking

Weighted scoring to produce final recommendations.

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8. Feature Engineering (AI-Ready)

Derived features include:

- Total recipe cost
- Total calories and macros
- Ingredient availability ratio
- Cost efficiency score

These features support both rule-based MVP and ML models.

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9. System Architecture (High-Level)

- Frontend (Web / Mobile)
- Backend API (Business logic, scoring engine)
- Data Layer (Relational DB)
- AI Layer (Feature computation, ranking)

Future-ready for:

- Model serving
- Workflow automation

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10. AI Automation Roadmap

Phase 1 - Decision Support (MVP)

- Rule-based recommendations

- Static scoring logic

Phase 2 - Learning System

- User feedback loops
- Preference inference

Phase 3 - Business Flow Automation

- Auto meal planning
- Weekly budget optimization
- Nutrition adherence tracking

Phase 4 - Intelligent Operations

- Automated grocery suggestions
- Supplier price adaptation
- Personalised nutrition agents

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11. Business Automation Opportunities

- Ingredient restock alerts
- Meal plan auto-generation
- Budget-aware shopping lists
- Nutrition compliance monitoring

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12. Non-Functional Requirements

- Explainability-first AI
- Data privacy and security
- Scalable schema
- Reproducible results

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13. Risks & Mitigation

Risk	Mitigation

Limited data	Start rule-based
Overcomplexity	MVP-first scope
Nutrition inaccuracies	Verified data sources

14. Success Metrics

- Recommendation relevance
- User engagement
- Meal completion feedback
- Cost and nutrition adherence

15. Conclusion

CravesByIb is positioned to evolve from a **smart meal recommendation tool** into an **AI-driven food intelligence platform** that automates decision-making and optimizes everyday nutrition and cost efficiency.

The system is designed with long-term automation in mind while remaining practical, explainable, and deployable from day one.