Requirements - P.I. - Price Intelligence

1. Introduction

This document details the functional requirements for the Price Intelligence AI (P.I.) app. It outlines the specific capabilities needed for the application, incorporating the latest updates to AI providers and subscription plans.

2. Core Functional Requirements

2.1. User Accounts & Login

- Allow new users to register with an email and password.
- Verify new user emails.
- Log in registered users securely.
- Require strong passwords.
- Provide a secure password reset mechanism.
- Automatically assign "Free Trial" status (details defined under Subscription).
- Assign a unique ID to each user and link it to their data.

2.2. Item Analysis Request & Processing

- Allow logged-in users to start a new analysis.
- **Photo Upload System:**
  - Support multiple image formats (JPG, PNG, HEIF/HEIC).
  - Allow uploading multiple photos per item analysis request.
  - Provide immediate feedback on image quality/usability (e.g., resolution too low, blurry).
- Check if the user has analysis credits before starting.
- Deduct one analysis credit when the analysis processing begins.
- Securely store uploaded photos linked to the analysis.

- Show the user that the analysis is processing.
- Allow users to optionally specify the item's condition (New, Like New, etc.).

2.3. AI Analysis & Data Processing (Backend)

- **Image Enhancement:** Apply enhancement algorithms to uploaded images for potentially better AI recognition.
- **AI Image Analysis:**
  - Identify the item (category, brand, model where possible) using AI Vision APIs (e.g., **Google Cloud Vision**, Perplexity, Qwen, Gemini Pro, OpenRouter). The system may use one or multiple APIs for improved accuracy or based on configuration.
  - Assess item condition based on visual cues (supplements user input).
  - Detect key features/attributes (materials, color, etc.).
  - Generate a confidence score for the identification accuracy.
- **Price Estimation Engine:**
  - Integrate with market data sources for real-time valuation across key platforms (Google Shopping, Facebook Marketplace, eBay, Poshmark, Xtrader, etc.).
  - Calculate low, medium, and high estimated price ranges, with the recommended price being prominent.
  - Adjust price estimations based on item condition (AI-assessed).
- **Marketplace Recommendation System:**
  - Analyze suitability of top platforms (Google Shopping, Facebook Marketplace, eBay, Poshmark, Xtrader, etc.) for the identified item category and price point.
  - Calculate estimated commission/seller fees for each recommended platform. **Fee data must be kept reasonably current.**
  - Rank recommendations prioritizing potential net profit (Price - Fees).
  - Provide insights into platform reach/audience relevant to the item (briefly).

    - Predict a basic success likelihood or suitability rating for top recommended platforms.
- **Listing Content Generator:**
    - Generate SEO-optimized listing titles using identified item details via LLM APIs (e.g., Google, OpenAI, Perplexity, Qwen, OpenRouter).
    - Generate detailed item descriptions based on identified features and condition.
    - Recommend relevant keywords and tags.
    - Generate content adaptable to common templates/styles of target marketplaces.
- Save all analysis results (item details, condition, confidence, price ranges, recommendations with fees/insights, generated content) linked to the analysis ID and user ID.
- Handle processing errors gracefully and record the error status.

2.4. Results Display & Interaction

- Notify the user upon analysis completion.
- Display successful results clearly, including:
    - Uploaded image(s).
    - Identified Item Name (with confidence score if available).
    - Item Condition (user-provided and/or AI-assessed).
    - Predicted Price Range (Low, Medium, High).
    - Top Recommended Marketplace(s) with reasoning (including fee impact, audience/reach notes, success prediction).
    - Generated Title, Description, and Tags.
    - **Historical Pricing Trends:** Visualize basic historical pricing trends for the identified item type (if data available).
- Provide separate "Copy" buttons for key result parts (Name, Condition, Price, Title, Description, Tags).

- Show a clear error message if analysis fails.

2.5. Subscription Management

- Provide an "Account" / "Subscription" page.
- **Define and manage tiered access levels:**
  - **Free Trial:** 2 analyses total upon sign-up.
  - **Basic:** $9.99/month for 20 analyses.
  - **Pro:** $19.99/month for 50 analyses.
  - **Business:** $29.99/month for 100 analyses.
  - **Enterprise:** $69.99/month for unlimited analyses.
  - *(Note: Pricing and credit amounts are per month unless otherwise specified. Define rollover/expiry rules for unused credits if applicable).*
- Show the user's current plan, status, and remaining analysis credits/quota for the current billing period.
- Track usage against plan quotas. Prevent analysis initiation if quota is exceeded (except for Enterprise).
- Integrate secure payment processing (e.g., Stripe) for purchasing/upgrading plans.
- Link to a payment provider portal (e.g., Stripe Customer Portal) for managing payment methods and cancellations.
- Update user plan status/credits based on payment events (via webhooks).

2.6. User Dashboard & History

- Provide a dashboard showing the user's analysis history.
- List past analyses with summaries (image, name, date, price, top marketplace, status).
- Allow filtering history (date, category, marketplace, status).
- Allow clicking an analysis to view its full results.
- Allow exporting selected analysis data (CSV, PDF).

- **Inventory Management:** Allow users to view and manage their scanned items list (beyond just history).
- **Aggregate Trends:** Display aggregate pricing history and trends based on the user's scanned items or categories.
- **Saved Items:** Allow users explicitly save specific analysis results/recommendations for easy reference.

2.7. Administration

- Provide a secure basic admin interface.
- Allow viewing aggregate usage statistics.
- Allow lookup of user account details and status.
- Allow basic configuration management (e.g., API keys, default AI provider selection).