Google Cloud

PRESENTS

Agentic AI Day

Build the next generation of intelligent agents

Powered by H2S

Team Details

a. **Team name: Hackoverts**
b. **Team leader name: Samyuktha M S**
c. **Problem statement: Receipt Management for Google Wallet**

Brief about the idea

- **Project Raseed** is a Flutter-based mobile app (**PocketSage**) that transforms everyday receipts into intelligent, actionable financial insights using **Google AI and Google Wallet.**
- Goes beyond receipt scanning by offering **dynamic Wallet passes** for return reminders, weekly spend digests, savings tips, and eco-friendly purchase insights.
- Built with **Gemini's multimodal and conversational capabilities** to support photo, voice, and local language inputs.
- Acts as an **agentic assistant** that learns from user behavior and proactively offers nudges, like tracking warranties, flagging overspending, or suggesting inventory restocks.
- Offers features like **EcoScore tracking, smart inventory management, and context-aware modes** (e.g., groceries, travel, reimbursements).
- Designed for inclusivity with **multilingual voice interaction,** making it accessible for a wide range of users.
- Reimagines receipts as a **continuous feedback loop**, turning purchases into personalized financial guidance.
- Integrates with **Google Wallet API** to keep insights persistent and updated, eliminating the need for active app usage.
- Helps users make smarter decisions effortlessly, improving everyday financial habits without overwhelming them.

Opportunities

- ### How different is it from any of the other existing ideas?

  - Unlike generic expense trackers or budgeting apps, **PocketSage** goes beyond passive logging by providing agentic, context-aware actions using real-time data from receipts.
  - Existing apps focus on OCR and categorization — **PocketSage** offers **dynamic Wallet passes, smart nudges, and proactive suggestion**s based on user behavior.
  - Introduces **eco-conscious spending insights**, **inventory awareness**, and **voice-first multilingual interaction**, which are missing in traditional finance tools.
  - Integrates tightly with the **Google Wallet ecosystem**, allowing users to receive persistent, actionable insights without needing to open the app, a behavior-shift from app-dependent tools.
  - Enables **contextual financial modes** (e.g., groceries, travel, reimbursements) that adapt automatically based on receipt content — unlike traditional apps with static categories.
  - Combines **Gemini's multimodal + conversational power** to support photo, video, and local language voice input, making it accessible and intelligent across diverse user needs — a first for receipt-based financial tools.

Opportunities

- **How will it be able to solve the problem?**

  - **Receipts become intelligent triggers** — enabling users to stay on top of returns, warranties, subscriptions, and spending habits without effort.
  - **Gemini-powered multimodal ingestion** makes the app usable via photos, videos, voice, and text, ideal for real-world receipt formats.
  - **Google Wallet integration** ensures insights are not lost in an app but are persistent, push-notified, and visible in everyday life.
  - Transforms scattered, unstructured spending data into **centralized, actionable insights** — helping users make smarter financial decisions daily.
  - **Context-aware features** like virtual pantry updates, travel mode, or restock reminders eliminate the need for manual tracking or multiple apps.
  - Enables **inclusive financial awareness** through multilingual voice interaction, making advanced financial tools accessible to a broader demographic.

Opportunities

- **USP of the proposed solution**

  - 📲 **Receipts** — Real-time, context-aware Wallet passes
  - 🧠 **Proactive agentic intelligence** — not just analysis, but timely nudges
  - 🌍 **Localized, inclusive design** with multilingual voice inputs
  - 🌱 **EcoScore-driven insights** for sustainability-aware users
  - 🧾 **Virtual pantry & smart purchase memory** for smarter repeat decisions
  - 🔔 **No need to open the app constantly** — key insights come to the user through Wallet passes
  - 🔄 **Context-switching modes** — automatically adapts to scenarios like travel, groceries, or reimbursements based on receipt content.
  - 📊 **Spending pattern summaries via Wallet** — personalized digests delivered weekly without user effort.
  - 📥 **Seamless multimodal ingestion** — supports photo, video, livestream, and voice input for maximum real-world usability.
  - 🧾 **Auto-generated actionable passes** — receipts trigger smart passes like return alerts, spend caps, or budget warnings with zero manual input.

List of features offered by the solution

- **Multimodal Receipt Ingestion**
  - Accepts photos, scanned documents, videos, or live streams of physical receipts.
  - Uses **Gemini's multimodal capabilities** to extract item-level details like product names, quantities, prices, taxes, offers, and vendor names.
  - Handles multi-language receipts, handwritten data, or faded prints via intelligent text reconstruction.

- **Voice-Based Input (Multilingual)**
  - Users can speak queries or commands like:
    - "*How much did I spend on groceries last week?*" or "*Do I have detergent left?*"
  - Works in **regional Indian languages** (Tamil, Hindi, etc.), promoting accessibility across demographics.

- **Google Wallet Pass Generation**
  - Automatically creates **smart Wallet passes** for:
    - Expense summaries, Return & warranty reminders, Restock alerts, Shopping lists, EcoScore and budget trends
  - Passes are interactive, updated in real-time, and persistent even when the app isn't opened.

List of features offered by the solution

- **Proactive Nudges & Smart Alerts**
  - Based on receipt history, usage pattern, and time:
    - *"You're overspending on food delivery this month."*
    - *"Milk may be running out based on last week's purchase."*
    - *"Your shoe warranty expires in 2 days."*
  - Delivered as push notifications and/or **Wallet pass updates**.

- **EcoScore & Conscious Spending Insights**
  - Each purchase is evaluated for **sustainability** (local vs imported, organic tags, plastic-heavy items).
  - Users receive an EcoScore and monthly eco-footprint trends, encouraging sustainable habits.

- **Smart Inventory Tracker (Virtual Pantry)**
  - Automatically builds a **pantry list** from grocery receipts.
  - Helps users track:
    - What's in stock, What's expiring, What meals can be made from current inventory
  - Includes auto-generation of shopping lists when key items are low.

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List of features offered by the solution

- ## Context-Aware Modes (Smart Modes)
  - App detects context from receipts and adapts:
    - **Travel mode**: Tracks trip expenses, daily budget, hotel/flight bookings
    - **Reimbursement mode**: Groups business-related expenses and exports summaries
    - **Home essentials mode**: Restock alerts and consumption-based reminders

- ## Agentic Financial Assistant
  - **PocketSage** functions as an intelligent, memory-based assistant, not just a query tool.
  - Understands trends over time and delivers personalized, goal-based financial guidance (e.g., "*Reduce your grocery bill by ₹600/month by switching to X.*")

- ## Spending Analysis & Visual Insights
  - Tracks **category-wise and vendor-wise spending**, price inflation, and expense trends over time.
  - Offers easy-to-read visualizations, comparisons, and actionable summaries.

List of features offered by the solution

- **Smart Purchase Memory**
  - Remembers past purchases — shows:
    - *When and where items were bought*
    - *Historical prices (price inflation tracking)*
    - *Frequency and next expected restock*
  - Great for **personal finance + household management**.

- **Recurring Subscription Detection**
  - Detects **subscriptions hidden in receipts** (e.g., OTT, meal kits).
  - Sends nudges for review/cancellation and tracks total monthly recurring cost.

- **Reimbursement-Ready Export**
  - Users can **tag receipts as "official" or "claimable"**.
  - The app auto-generates a grouped PDF/CSV summary with itemized billing and merchant details for easy expense reporting.
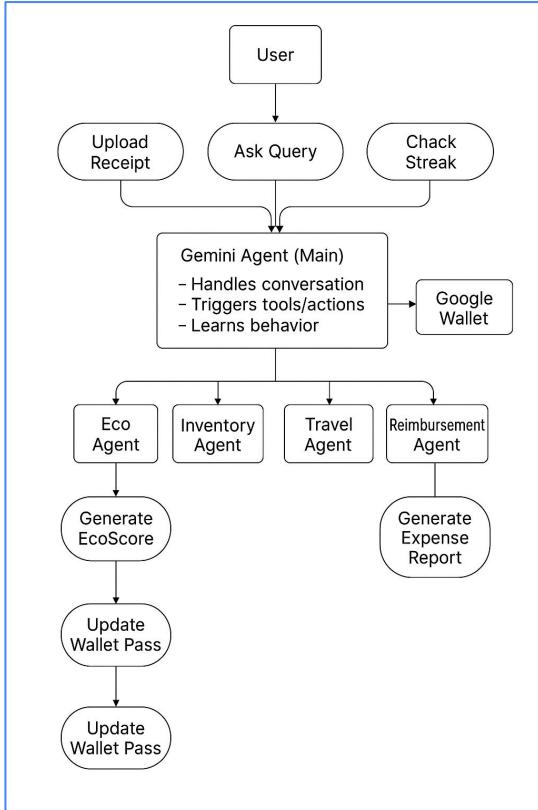
List of features offered by the solution

- **Natural Language Financial Chat**
  - Users can ask:
    - "*How much will I spend next month if I keep the same habits?*"
    - "*Can I cut down on my grocery bills?*"
    - "*Suggest cheaper alternatives for my current brands.*"
  - **Gemini** responds with intelligent, user-specific answers.

- **Weekly & Monthly Digest Passes**
  - Summarizes all financial activity into **Wallet Pass** summaries — includes:
    - Spend overview, Category spikes, Budget warnings, Tips to save more
  - Passes are automatically updated and push-notified.

- **Personal Goals & Budget Tracking**
  - Users can set **custom goals** (e.g., "*Spend less than ₹5000/month on groceries*").
  - **PocketSage** will provide goal tracking, feedback, and nudges to stay aligned.
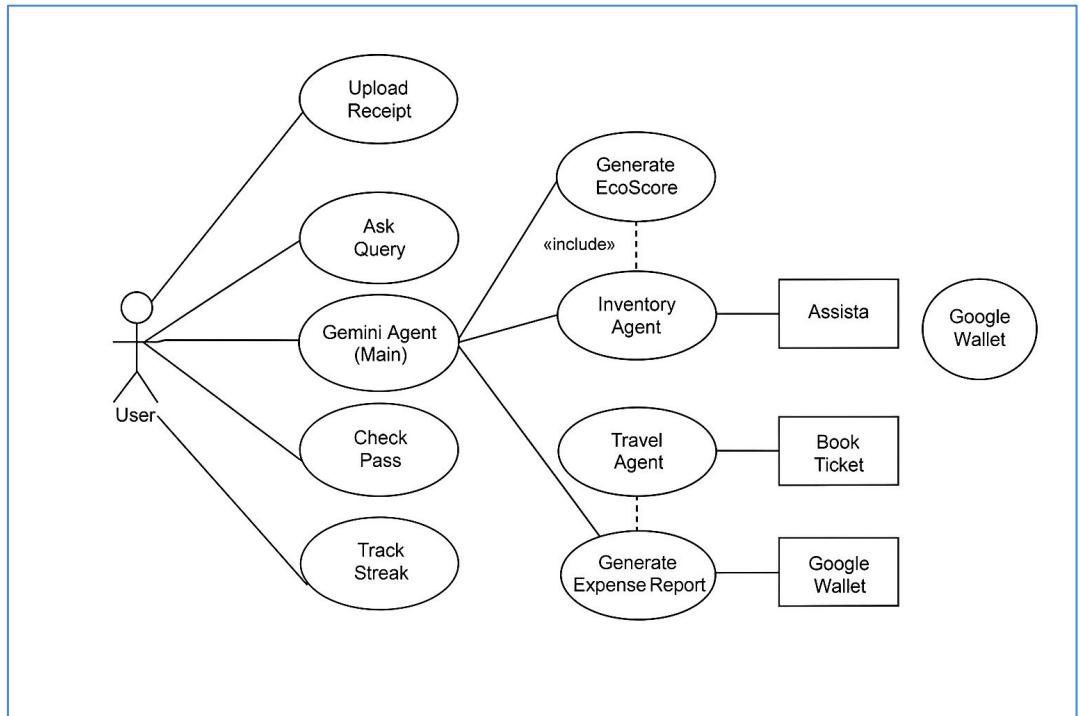
List of features offered by the solution

- **WhatsApp & SMS Integration for Paperless Bills and E-Commerce Platforms Synchronization**
  - **PocketSage** connects with WhatsApp and SMS inbox to detect digital receipts, OTPs, and order confirmations from e-commerce platforms, like Amazon and Flipkart. Automatically extracts:
    - *Order amount, item details, delivery date*
    - *Return window & warranty data*
  - Agent uses this data to auto-generate **Wallet passes** (e.g., "*Return this by Friday*", "*Warranty expires soon*").

- **Auto-Scanning Receipts from Gmail**
  - Securely integrates with Gmail API to detect:
    - *E-commerce receipts*
    - *Subscription confirmations*
    - *Utility bills and invoices*
  - Parsed emails are converted into structured data and fed into the same pipeline as photo/video receipts.
  - **Gemini** agent auto-generates insightful passes without user action.

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Process flow diagram

Use-Case diagram

Technologies to be used in the solution

- **Gemini (via Vertex AI)**
  - Powers the core **LLM intelligence** for reasoning and conversations.
  - Handles **multimodal input** — photos, videos, voice, and text.
  - Supports tool/function calling to trigger wallet passes, queries, and nudges.

- **Vertex AI Agent Builder**
  - Orchestrates the **agentic behavior** of the assistant.
  - Enables context-aware responses and decision-making.
  - Allows creation of sub-agents (e.g., Eco Agent, Travel Agent, Inventory Agent).

- **Gmail API**
  - Scans and parses e-receipts from Gmail (e-commerce, bills).
  - Converts emails into structured JSON for Gemini reasoning.

- **SMS & WhatsApp Parsing**
  - Integrates with SMS inbox and optionally WhatsApp to detect:
    - Purchase confirmations, invoices, OTPs.
  - Enables paperless receipt ingestion beyond physical bills.
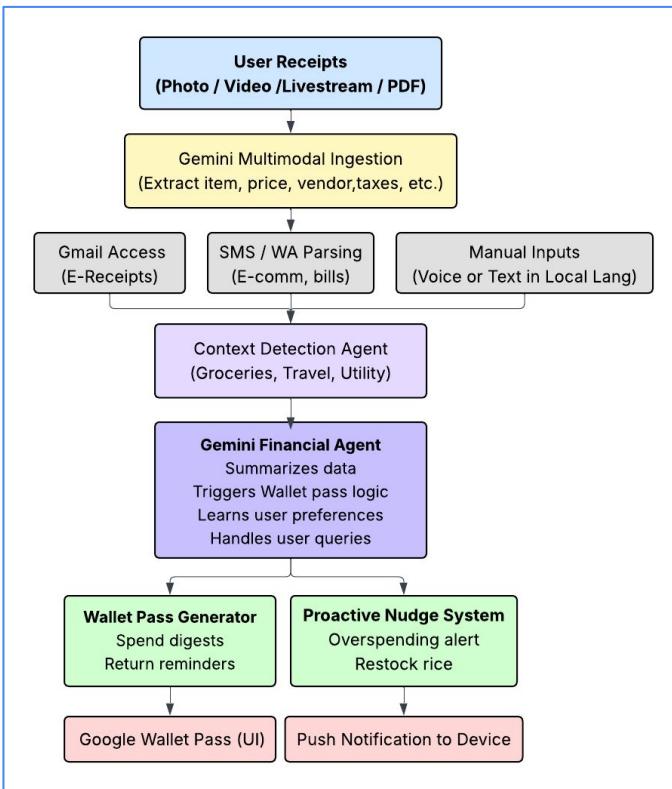
Technologies to be used in the solution

- **Google Wallet API**
  - Creates **dynamic Wallet** passes:
    - Return reminders, savings tips, shopping lists, digests.
  - Passes are updated in real-time by the agent.
  - Supports push notifications for proactive alerts.

- **Cloud Translation API**
  - Enables **multilingual support** for voice and text inputs.
  - Makes the app inclusive and accessible to regional language users.

- **Firebase Cloud Messaging (FCM)**
  - Sends push notifications when:
    - New insights are available.
  - Return/warranty reminders need user attention.

- **Google Cloud Functions / Cloud Run**
  - Used to **handle background processing**:
    - Receipt parsing, wallet updates, email/SMS ingestion.
  - Supports scalability and automation of backend services.

<u>Technologies to be used in the solution</u>

- **BigQuery**
  - Stores **long-term financial data** (receipts, categories, trends) in a secure, scalable cloud warehouse.
  - Enables **advanced querying and comparison**, like monthly spending drift, savings growth, or recurring subscriptions.
  - Powers deep personalization by feeding historical insights to Gemini agents for smarter predictions and nudges.

- **Looker Studio**
  - Builds **interactive dashboards** for internal use or power users to explore financial behavior.
  - Visualizes data from BigQuery: spend breakdowns, EcoScore trends, saving streaks, inventory usage.
  - Enables report exports and quick insights without code — ideal for user transparency and agent monitoring.

Architecture diagram of the proposed solution

1. **Input Layer**
    a. Users upload receipts via photo, video, livestream, or PDF.
    b. Additional sources include Gmail, SMS/WhatsApp, and manual voice/text input in local languages.
2. **Multimodal Ingestion**
    a. A Gemini-powered engine extracts key details: items, prices, vendor names, taxes, etc.
3. **Context Detection Agent**
    a. Classifies receipts into smart categories like groceries, travel, utilities, and more.
4. **Gemini Financial Agent**
    a. Acts as the brain: summarizes data, learns from behavior, answers queries, and triggers insights.
5. **Output Layer**
    a. Wallet Pass Generator creates real-time Google Wallet passes for spend digests, return alerts, etc.
    b. Proactive Nudge System sends push notifications with smart alerts like restock reminders and overspending warnings.

Wireframes/Mock diagrams of the proposed solution

Screen 1 — Dashboard

Good morning, Alex
Here's your weekly spending summary

$847.32
↗ 17.1% vs last week

🛒	Groceries	$234.50
🚃	Transportation	$156.80
🏠	Utilities	$189.20
☕	Dining	$142.30
✈	Travel	$124.52

Quick Actions
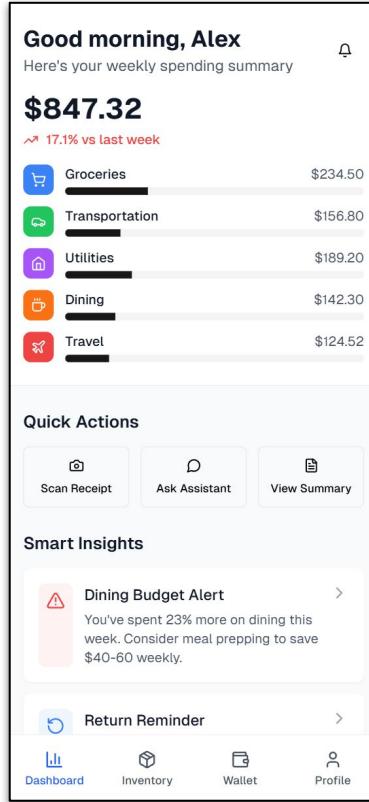
- Scan Receipt
- Ask Assistant
- View Summary

Smart Insights

⚠ **Dining Budget Alert**
You've spent 23% more on dining this week. Consider meal prepping to save $40-60 weekly.

↺ **Return Reminder**

Dashboard | Inventory | Wallet | Profile

Screen 2

↺ **Return Reminder**
Your Nike shoes from Amazon have 3 days left for returns. Original price: $89.99

🌿 **Eco-Friendly Win!**
Your reusable water bottle purchase will save ~$156/year vs. bottled water.

📦 **Restock Suggestion**
You're running low on coffee pods. Best deal: $24.99 at Costco (vs $31.99 elsewhere).

Active Passes   View All

● **Budget Warning**
Dining category
123% of budget

● **Return Rem**
Nike Air Max
3 days left

🌿 **EcoScore**   **78**
This week's impact   +5 from last week

Great job! You're in the top 25% of eco-conscious spenders.

Dashboard | Inventory | Wallet | Profile

Screen 3 — Scan Receipt
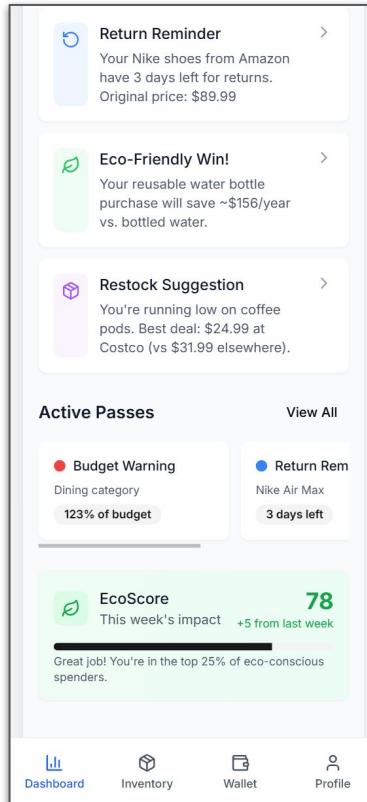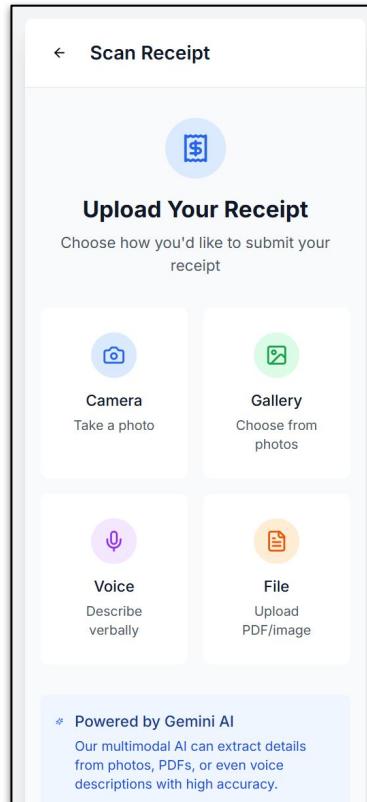
← **Scan Receipt**

Upload Your Receipt
Choose how you'd like to submit your receipt

📷 **Camera**
Take a photo

🖼 **Gallery**
Choose from photos

🎤 **Voice**
Describe verbally

📄 **File**
Upload PDF/image

✴ **Powered by Gemini AI**
Our multimodal AI can extract details from photos, PDFs, or even voice descriptions with high accuracy.

Screen 4 — Receipt Details
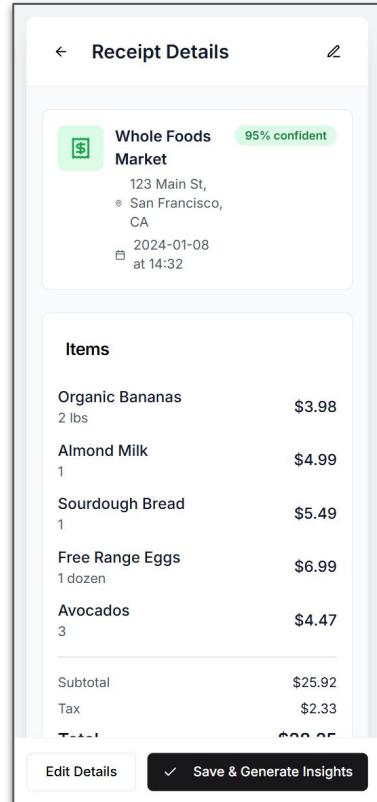
← **Receipt Details**   ✎

🧾 **Whole Foods Market**   95% confident
123 Main St,
San Francisco, CA
📅 2024-01-08 at 14:32

Items

Organic Bananas	2 lbs	$3.98
Almond Milk	1	$4.99
Sourdough Bread	1	$5.49
Free Range Eggs	1 dozen	$6.99
Avocados	3	$4.47

Subtotal	$25.92
Tax	$2.33
Total	$28.25

Edit Details   ✓ Save & Generate Insights

Screen 1 — Dashboard

Return Reminder
Your Nike shoes from Amazon have 3 days left for returns. Original price: $89.99

Eco-Friendly Win!
Your reusable water bottle purchase will save ~$156/year vs. bottled water.

Restock Suggestion
You're running low on coffee pods. Best deal: $24.99 at Costco (vs $31.99 elsewhere).

Active Passes   View All

Budget Warning
Dining category
123% of budget

Return Rem
Nike Air Max
3 days left

EcoScore   78
This week's impact   +5 from last week

Great job! You're in the top 25% of eco-conscious spenders.

Dashboard   Inventory   Wallet   Profile

Screen 2 — Wallet Passes

← **Wallet Passes**

Smart Wallet Integration
These passes live in your device wallet and provide value without opening the app.

Active Passes

Return Reminder
Nike Air Max 270
Return by July 15, 2024
3 days left   Urgent

Overspending Warning
Grocery Budget
₹500 over monthly budget
123% of budget   Urgent

EcoScore Update
Sustainable Choices
78/100 EcoScore this week
+15 points

Recent Activity

Screen 3 — Smart Nudges

← **Smart Nudges**

Proactive Intelligence
AI-powered nudges help you make smarter financial decisions in real-time.

All   High 1   Medium 1   Info 2

Detergent Running Low   MEDIUM
Detergent may be running out based on past purchase date
1 hour ago   Household

Warranty Expiring Soon   HIGH
Warranty for your Sony headphones expires tomorrow
3 hours ago   Electronics

Cashback Opportunity   INFO
Earn 5% cashback on groceries this weekend with HDFC card
6 hours ago   Offers

Price Drop Alert   INFO
iPhone 15 Pro you wishlisted is now ₹8,000 cheaper
2 days ago   Electronics

Recently Dismissed   View All

Screen 4 — Nudge Details

← **Nudge Details**

Detergent Running Low   MEDIUM
Detergent may be running out based on past purchase date
1 hour ago

Details

Last Purchase	45 days ago
Average Usage	42 days
Estimated Run Out	3 days
Best Deal	₹89 at BigBasket (₹15 off)
Alternatives	Ariel (₹95)
	Surf Excel (₹78)
	Tide (₹102)

Quick Actions

Add to shopping list

Find best deals