AuraPet – Your New Budget Tracker

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COMP3330-**Group20**

https://github.com/BYLinMou/COMP3330-Gp20

Introduction

72% of young adults, according to Bank of America (2025), have taken steps to improve their financial health in the past year, such as saving more (51%) or reducing debt (24%). This reflects heightened awareness among 18-35-year-olds facing student loans, entry-level pay, and urban costs like in Hong Kong, often leading to impulsive spending and debt. AuraPet targets this group to build financial literacy via an engaging app that makes budgeting rewarding, promoting early habits for independence and well-being. Yet, existing apps disappoint with dull interfaces, heavy manual entry, missing sustainability / mental health links, and privacy risks from bank ties, causing high drop-off rates.

Problem Statement

Current spending trackers fail to captivate users, resulting in inconsistent usage and limited financial improvements. Research shows that while 53.8% of people manually track expenses, only 20.9% use apps due to complexity and lack of motivation. Key weaknesses include:

- **Lack of Engagement**: Static charts bore users; minimal gamification leads to quick abandonment.
- **Manual Overload**: Tedious entry discourages use, with issues in AI categorization.
- **Narrow Focus**: Apps overlook environmental or mental health impacts, despite demand for holistic tools.

Below is a comparison table between five Hong Kong App Store budgeting apps:

App Name	AI Features	Gamification Elements	Major Issues	App Store Ratings
Money+ Cute Expense Tracker by Chongqing Zhouhu Technology	No	No	Bills in budgets; VIP issues; too basic	4.8/5 (16.3K ratings)

Fortune City: Expense Tracker by SPARKFUL	Yes (Smart notes based on behaviors / locations)	Yes (City-building with expenses)	Lagging / freezing; no transfers / hides; slow upgrades	4.5/5 (10K ratings)
Monny by Greamer	No	Yes (Challenges / achievements)	No transfers / carry-overs; feminine theme; breakdowns lacking	4.7/5 (8.7K ratings)
Spending Tracker - Budget by LightByte	Yes (AI import, receipt scan)	No	Transaction glitches; limited funds / adds; inaccurate views	4.8/5 (4.4K ratings)
Money Manager by RealByte	No	No	No investments; inflexible budgets; account limits	4.7/5 (3.3K ratings)

Table 1 Competitor Analysis

From the comparison, most apps lack robust AI for smart tracking or gamification for engagement, with common issues like glitches, inflexible budgeting, and basic interfaces persisting despite solid ratings. This underscores opportunities for AuraPet to innovate with seamless AI, immersive pet-based rewards, and user-centric features to boost retention and satisfaction.

Proposed Solution

AuraPet addresses budgeting challenges by making finance management engaging and effortless for young adults, fostering long-term habits to prevent debt and promote wellness.

By reducing manual input through AI and inspiring positive behaviors via gamified rewards (our digital pet mentor function), it turns tedious tracking into an imaginative, motivating experience, ensuring users stay committed to financial goals with emotional connection and fun unlocks.
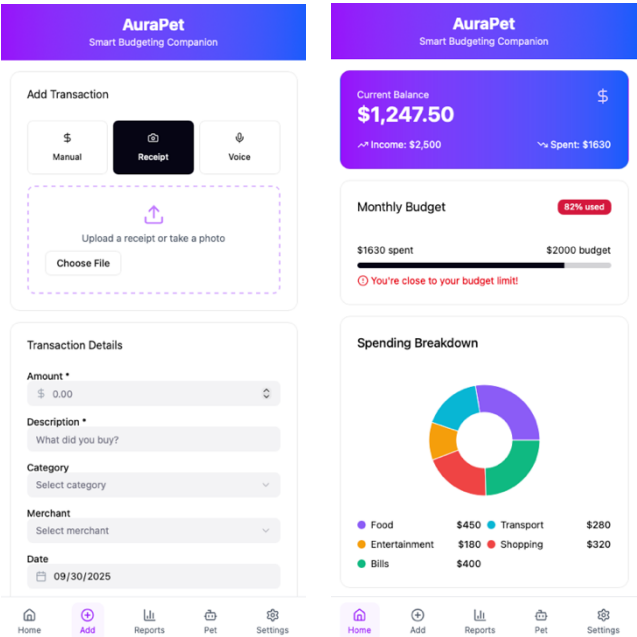
Features & Functions

1 Core Functions

1.1 Intelligent Receipt Scanning:

- Automatically extracts key details such as the amount, date, expense category, and merchant information from uploaded photos/screenshots of receipts, invoices, or bills.

- If any recognition results are inaccurate, users can make manual corrections.

1.2 Manual transactions input:

- Users can input records manually.

2 Advanced Features

2.1 Data Analysis & Visualization

- Income and expense summaries with **pie chart and bar charts** to visualize spending distribution.
- **Trend analysis** to identify major spending areas and long-term consumption patterns.
- **Budget reminders**: the system alerts users when nearing the limit set by user.
- Quick search by keyword, date, or category.
- Multi-condition filtering, e.g., "find all *transportation expenses* from *last month* paid by *Octopus*."

2.2 Personalization

- Users can customize categories, tags, and currency units.
- Multi-language and multi-currency support for global user adoption.

2.3 Cross-Platform Synchronization

- Supports **iOS, Android**, and Web platforms with **secure cloud-based storage**.
- Enables seamless multi-device access and **account management** anytime, anywhere.
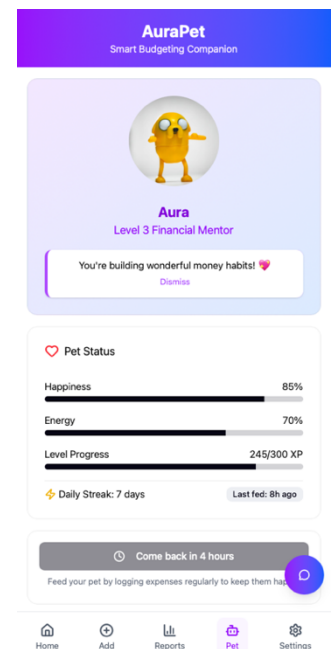
2.4 Chatbot Intelligence

- **Intelligent Transaction Capture**: Capture records through voice or text.
- **Financial Planning Recommendations**: Offer tailored investment or savings suggestions based on spending habits.

3   Engagement Feature

3.1 Digital Pet Mentor

- **Habit-Forming Interaction**: Users must "feed" the pet by inputting records regularly (e.g., every 12 hours), encouraging them to open the app frequently and log expenses consistently.
- **Behavioral Feedback**: The pet's mood changes according to the user's spending habits.
- **Reward Mechanism**: Achieving financial goals (e.g., staying within the monthly budget) unlocks cosmetic items like outfits for the pet, enhancing gamification.
- **Mentor Role**: The pet acts as both a companion and a financial mentor, offering guidance and encouragement to make money management less tedious.

Methodology

Our development approach is aimed at creating powerful cross-platform applications with intelligent functionality at a zero / low cost, ensuring both technical efficiency and high-quality user experience.

I.   Software Implementation

AuraPet will be built for iOS and Android using **React Native**, ensuring a consistent user experience across devices. We will use **GitHub Actions** for continuous integration and deployment, enabling simultaneous updates for both platforms.

II. Backend Infrastructure and Data Management

Supabase is selected as our Backend-as-a-Service (BaaS) which provides a cloud-based PostgreSQL database for managing user authentication and cloud-based data synchronization for transaction records and budget settings.

III. Optical Character Recognition (OCR)

For intelligent receipt scanning, we will use **PaddleOCR** (PaddlePaddle, 2025) and compare three workflows to balance accuracy, speed, and cost:

1. **OCR + LLM:** OCR extracts text, which an LLM then structures.
2. **Direct LLM:** An LLM analyzes the receipt image directly.
3. **Hybrid Model:** An LLM processes both the image and OCR-extracted text.

IV. API Selection for Large Language Model (LLM)

Our group developed ReceiptSmartAnalyzer (Xie, 2025) to evaluate performance of different API suppliers and LLM models. **OpenRouter** was chosen as the most cost-effective API provider for receipt analysis together with "**gemini-2.0-flash-exp: free**" model.

Implementation Plan (8-week Roadmap)

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Frontend UI & Pet System	Backend Database & API	AI Receipt Scanning & Chatbot

Table 2 Division of Labor

Phase 1: Foundation & Prototyping (Weeks 1-2)
Establish environments and validate core technologies.

- **Frontend:** Build static UI mockups for key screens.
- **Backend:** Configure Supabase, design the database schema, and implement user authentication.
- **AI:** Develop a proof-of-concept for the receipt analysis feature.

Phase 2: Core Feature Development (Weeks 3-5)
Build and integrate the app's primary functionalities.

Integrate manual transaction entry (Frontend ↔ Backend).
Integrate intelligent receipt scanning (AI → Backend → Frontend).

- **Frontend:** Develop dynamic data visualizations and the basic digital pet interface.

- **Backend:** Create APIs for data processing, budget logic, and pet status updates.

- **AI:** Finalize the receipt analysis API for backend integration.

Phase 3: Refinement & Enhancement (Weeks 6-7)

Polish the user experience and add advanced features.

- **Frontend:** Implement the pet reward mechanism and refine the UI/UX.

- **Backend:** Focus on performance and security optimizations.

- **AI:** Develop chatbot intelligence features.

Phase 4: Finalization & Deployment (Week 8)

Final stability testing, project documentation and a stable application release.

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