Lab 1 – CreditTrax Product Description

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1 Introduction

In recent years, personal debt has become an increasingly pressing issue for many Americans. According to the Federal Reserve, total consumer credit reached a staggering $5.1 trillion in August 2024, marking a significant increase from previous years (Board of Governors of the Federal Reserve System, 2024). This trend is particularly concerning for young adults, who face mounting student loan debts averaging $37,338 per borrower and rising costs of living in major metropolitan areas.

The increasing debt burden has far-reaching consequences, impacting individuals' financial stability, mental health, and future prospects. Research indicates that young adults with high debt levels may experience reduced credit scores by up to 100 points, potentially jeopardizing their long-term financial well-being (Martinchek & Santillo, 2024). Furthermore, the struggle with debt often leads to higher rates of stress and depression, creating a vicious cycle that can be difficult to break. These mental health concerns persist throughout a person's life, compounded by the worry and looming uncertainty caused by their unsustainable debt (Gravier, 2024).

To address this worsening problem, there is a clear need for accessible, user-friendly tools that can help individuals manage their debts and finances effectively. An ideal solution would encompass a comprehensive approach that goes beyond simple tracking, integrating multiple supportive elements to empower users. Such a tool might include robust financial tracking capabilities that provide clear, real-time insights into an individual's financial health, complemented by personalized budgeting guidance tailored to their unique circumstances.

Enter CreditTrax, an innovative smartphone application designed to empower young adults and young professionals in their journey towards debt freedom. By combining smart payment reminders, algorithmic-driven budgeting suggestions, and an engaging personal financial

dashboard, CreditTrax offers a holistic approach to debt management and financial literacy that addresses the unique challenges faced by today's consumers.

2 CreditTrax Product Description

CreditTrax is a financial management and educational application designed for young adults and professionals, offering a comprehensive solution to navigate the complexities of personal finance. The application provides a robust platform for debt tracking, allowing users to input and monitor various financial obligations and receive smart payment reminders. Powered by artificial intelligence, CreditTrax delivers personalized budgeting recommendations by analyzing income, expenses, and debt patterns, suggesting strategies like the 50-30-20 budget plan to optimize financial health. Its intuitive personal financial dashboard uses data analytics and visualization tools to help users understand their financial landscape, offering real-time insights and "what-if" scenario analyses that enable informed decision-making.

2.1 Key Product Features and Capabilities

One key product feature is debt tracking. It allows users to view and track their debts, providing a centralized platform for managing multiple financial obligations such as credit card balances or student loans. Unlike traditional finance applications, CreditTrax integrates smart payment reminders, issuing escalating notifications until manual approval is granted. This may help reduce missed payments, late fees, and negative credit impacts, fostering better financial habits.

The application also delivers AI-driven budgeting recommendations by analyzing the user’s income, expenses, and debt obligations. These personalized suggestions help users optimize their financial plans, reduce unnecessary spending, and efficiently allocate funds to debt

repayment. Additionally, users can set and track both short-term and long-term financial goals, providing the flexibility to adjust financial strategies based on their life circumstances.

To motivate users, CreditTrax incorporates a rewards-based gamification feature. Users earn badges for achieving milestones such as reducing debt, adhering to budgets, or meeting savings goals. The leaderboard ranking system allows users to compare their progress with others, encouraging engagement through friendly competition. This innovative approach transforms financial responsibility into an engaging and rewarding experience.

CreditTrax goes beyond basic budgeting by incorporating financial literacy tools. Educators can share external resources such as videos, articles, and blogs directly through the platform. This feature addresses gaps in financial education for young adults, empowering them with the knowledge to make informed financial decisions.

Many young adults struggle with financial uncertainty and lack the tools to foresee the consequences of their financial actions. The “What-If” Analysis feature bridges this gap by offering predictive insights that help users plan ahead, avoid financial pitfalls, and optimize their budgets effectively. It allows users to simulate various financial scenarios to understand the potential impact of their decisions on their overall financial health. Users can adjust variables such as income, expenses, debt repayment strategies, and unexpected expenses to see how these changes influence their financial outlook. Unlike static budgeting tools, the “What-If” Analysis feature provides dynamic, AI-driven insights that help users make data-driven decisions.

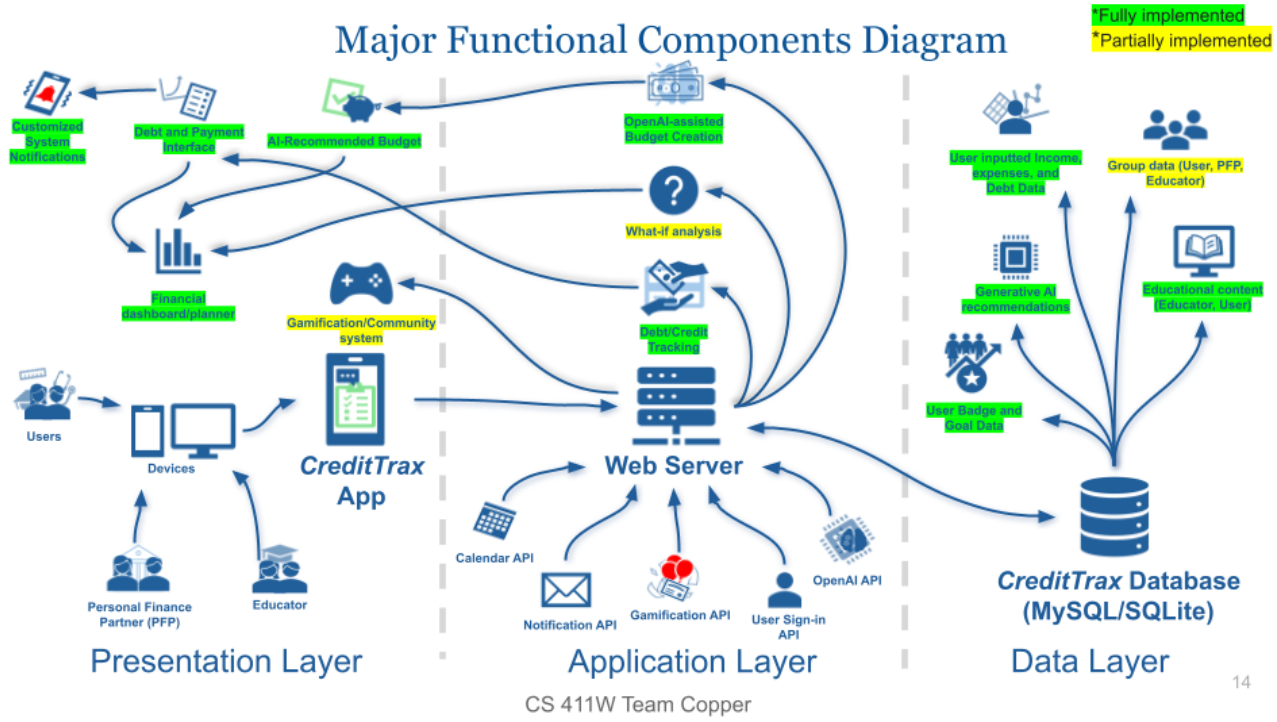
2.2 Major Components (Hardware/Software)

The Major Functional Components Diagram (Figure 1) illustrates the hardware and software structure required to implement the CreditTrax application. It provides an overview of

the interconnected systems supporting the application's features, such as debt tracking, budgeting, gamification, and analytics.

Figure 1

CreditTrax Major Functional Components Diagram



CreditTrax is a mobile web application designed for Android and iOS devices, allowing users to seamlessly access the application. Its web-based design ensures broad compatibility across smartphones.

The development of CreditTrax relies on a combination of programming languages and frameworks. The backend is built using PHP, leveraging the Laravel framework to handle server-side logic, authentication, and API interactions. On the frontend, the application uses HTML5, CSS (Tailwind CSS framework), and JavaScript (Alpine.js framework) to create a lightweight

yet dynamic interface. MySQL serves as the primary database, ensuring secure storage and efficient retrieval of user data, including income, budget plans, and progress tracking.

The application will use a central web server to process user requests, connect with APIs, and manage data flows between the front-end and database. To facilitate efficient development, Herd is used as the local development manager for Laravel applications, simplifying project setup and management. GitHub serves as the version control system, enabling collaborative development and code versioning. For testing, Jest is employed to validate front-end functionality, ensuring that UI components behave as expected, while PHPUnit is used for backend unit testing to verify AI-driven calculations, database integrity, and API interactions.

Several key APIs enhance CreditTrax's functionality. The Google Calendar API allows users to set and receive payment reminders, helping them avoid missed payments. The GameLayer API integrates gamification features, such as earning badges and competing in financial challenges, to motivate users. A significant component of the application is the OpenAI API, which plays a crucial role in intelligent financial decision-making. It powers the "What-If" Analysis feature, enabling users to model different financial scenarios such as increasing loan payments or adjusting expenses and receive AI-driven predictions on how these choices impact their long-term financial health. Additionally, it drives budgeting recommendations by analyzing users' income, expenses, and debt obligations, offering tailored strategies to optimize spending and improve financial stability.

3 Identification of Case Study

This product's primary user base consists of young adults aged 18-34, particularly young professionals and recent college graduates (or college students) who face challenges in managing debt and finances effectively. This demographic often struggles with substantial student loans,

credit card debt, and a lack of financial literacy, which can lead to poor financial decisions and increased financial stress. By offering personalized budgeting tools, debt tracking, and educational resources, the application empowers this group to develop sustainable financial habits, reduce debt, and achieve financial stability.

The case study focuses on college students, a primary target audience who often face challenges such as balancing limited income, managing student loan repayments, tracking living expenses, and saving for future goals.

The prototype demonstrates several key features that help address these challenges. In this scenario, Alex, a college student, uses CreditTrax to manage their finances. They set a short-term goal to save $300 for textbooks and a long-term goal to reduce student loan debt. Using the debt tracking feature, Alex monitors their loan balances and ensures timely payments. The budgeting recommendations help Alex adjust their spending by cutting non-essential expenses, while the "What-If" Analysis simulates how working an extra five hours per week impacts their financial goals. As Alex achieves savings milestones, they earn badges and reinforces their motivation and engagement.

While the prototype highlights critical functionalities like debt tracking, personalized budgets, and gamification features, the full implementation would offer advanced customizations, including more robust AI-driven real-time budgeting recommendations, comprehensive goal visualization tools, and integration with external resources for financial literacy. Additionally, the Real-World Product (RWP) would include complete account management capabilities, allowing users to create and manage personalized profiles for a more tailored experience.

CreditTrax is designed to support a wide variety of users, including young professionals juggling multiple loans, families managing household budgets, and educators aiming to improve financial literacy. The application's adaptability ensures it can meet the diverse financial needs of its users, offering practical tools to promote their financial stability and growth.

5 Glossary

- **AI:** Refers to algorithm-driven decision-making processes that analyze user financial data to generate personalized budgeting recommendations and predictive financial insights. It utilizes rule-based algorithms and pre-trained AI models (such as OpenAI's API) to perform “What-If” Analysis and budget optimization based on income, expenses, and debt obligations.
- **API**: A tool that allows the application to connect with other services to integrate extra features.
- **Credit Score**: A three-digit number that reflects an individual’s creditworthiness based on their credit history, influencing lenders' decisions on loan approvals and interest rates.
- **Debt**: Money that is borrowed and must be repaid, typically with interest.
- **Financial Literacy**: A strong understanding of essential financial skills and concepts, such as budgeting, saving, and debt management.
- **“What-if” Analysis**: A technique that allows users to simulate various (financial) scenarios and visualize their potential outcomes.
- **UI**: Refers to the visual and interactive elements that allow users to navigate the application and engage with its features, e.g. buttons, icons, and graphs.
- **Young Adults**: Individuals between the ages of 18 to 34 who are in the workforce and have limited experience with personal finances.
- **Young Professionals**: Young adults aged 18-34 who are in the workforce, in college, or have recently graduated.

6 References

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