Lab 1 – CreditTrax Product Description

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1   Introduction

Financial stress is a pressing issue for many young adults in the United States, driven by the rising cost of living, escalating student loans, mounting credit card debt, and limited financial education. Today, student loan debt exceeds 1.74 trillion dollars, with over half of students leaving college in debt (Safier & Young, 2024). Similarly, credit debt in the United States now totals over 1 trillion dollars and is increasing annually among young adults across the nation (Horymski, 2024). These financial pressures often delay important life milestones for young adults, such as marriage, buying a home, and starting a family, while also impacting their physical and mental health by increasing levels of anxiety, depression, and stress (Rademacher & Melford, n.d.).

While most individuals experience unexpected expenses like medical bills, car repairs, or household emergencies, young adults encounter these issues without the benefit of financial experience. Limited exposure to budgeting and the long-term impact of financial decisions can significantly hinder young people early in their careers, often leading to a future with no retirement in sight (Cariaga, 2024). Although many budgeting and debt management apps exist, they rarely prioritize user education. Young adults need an application that places their personal growth and financial well-being first by providing a seamless debt-tracking experience, personalized budgeting recommendations, and visualization of financial scenarios.

Introducing CreditTrax: a mobile web application that bridges these gaps by offering a comprehensive platform with predictive financial algorithms, debt tracking, and financial literacy tools in a single location. Through personalized data analytics, visualization, and What-if analysis, CreditTrax provides young adults with clear insights into their financial present and future, empowering them to navigate an uncertain phase of life and setting a strong foundation for future financial success.

2   Product Description

CreditTrax is a web-based mobile application created to guide young adults through the challenges of managing their finances. Without proper experience or guidance, early financial decisions can lead to long-term hardship and lasting setbacks. This is why CreditTrax emphasizes early financial education by providing tools for financial literacy, planning, and tracking, setting young adults on the right track from the start. By leveraging both hard-coded and AI-based algorithms, CreditTrax offers personalized, data-driven recommendations and insights to its users. Additionally, our What-If analysis tool offers a glimpse into future scenarios, giving young adults a clear window into their finances at any time, present or future, so they can rest assured that they are always on the right track.

2.1   Key Product Features and Capabilities

To facilitate early financial literacy and awareness, CreditTrax offers a range of features including a personalized financial dashboard, What-if analysis simulations, debt tracking, smart payment reminders, budgeting recommendations, a community rewards system, and the ability to set both short and long-term goals. These features are designed to provide clarity, guidance, and motivation for young adults managing their finances.

The personalized financial dashboard provides users with an organized snapshot of their financial health. It allows them to track and visualize their financial spending habits, debt obligations, financial goals, and earned rewards at a glance.

The What-If analysis tool utilizes both hard-coded and AI-based algorithms to help users simulate personal financial scenarios. Users can project a range of outcomes, such as: "What if I make the minimum payment on my student loan over the next year?" or "What if I allocate 10%

of my income after expenses into savings?" This ensures they have the foresight to choose the financial path that best suits their goals.

Seamless debt-tracking tools provide users with a clear, centralized view of their financial obligations. They can input all their debts, such as credit card balances and student loans, along with their respective interest rates and due dates, ensuring a real-time snapshot of their financial responsibilities. The opt-in smart notification system helps users stay on top of payments by prompting them to confirm when a debt has been paid. If they neglect to confirm, reminders will gradually increase in frequency as the due date approaches.

Personalized budgeting recommendations leverage AI technologies, such as ChatGPT's API, allowing users to interact with a personalized chatbot tailored to their specific debt and spending habits. Users receive personalized suggestions to reduce unnecessary spending and allocate funds more efficiently. Additionally, community and gamification features reward users for good financial habits by offering badges and monthly leaderboard points whenever they pay off a debt on time or achieve a financial goal. This gamification element promotes healthy, long-lasting financial decisions.

Finally, the goal-setting feature ensures users make continuous progress toward a better financial future. They can choose from a list of preset goals or create custom ones tailored to their needs. These goals integrate seamlessly with the what-if analysis and budgeting recommendations, helping users refine their financial choices. For instance, if a user aims to buy a new car by April of 2025, CreditTrax's innovative AI-driven budgeting feature factors in this expense when creating their personalized budget. Additionally, personal goals can serve as input for what-if analysis reports, ensuring they are considered in the results.

Unlike other financial applications on the market, CreditTrax provides innovation by integrating what-if analysis reports with AI-driven financial suggestions. This unique combination empowers young adults with the foresight to understand where their current financial path leads through detailed simulations. Meanwhile, a trained AI assistant provides personalized financial guidance based on these reports, ensuring users stay on track toward their financial goals.

2.2   Major Components (Hardware/Software)

CreditTrax is a web-based mobile application, designed primarily for Android and IOS devices. Users require a stable internet connection for optimal performance and interact with CreditTrax through its presentation, application, and data layers.

The presentation layer serves as the user interface for CreditTrax. It allows users to both visualize and input their financial information for processing by the application layer. Through this layer, users access CreditTrax via a web browser or mobile web application interface, allowing for the visualization of data and access to core features through communications with CreditTrax's web server.

The application layer is the processing hub of CreditTrax, powering key features such as the What-if analysis tool, budgeting recommendations, and smart notification reminders. API integration plays a crucial role here, enabling badge-based rewards with GameLayer, chatbot functionality with ChatGPT, and smart notification reminders with Google Calendar.

Finally, the data layer is the backbone of CreditTrax, managing system configurations and user data. It leverages a containerized version of SQLite with Docker to securely store and manage sensitive information, including credit transactions, debt records, and user profile data.

Figure 1

Major Functional Components Diagram
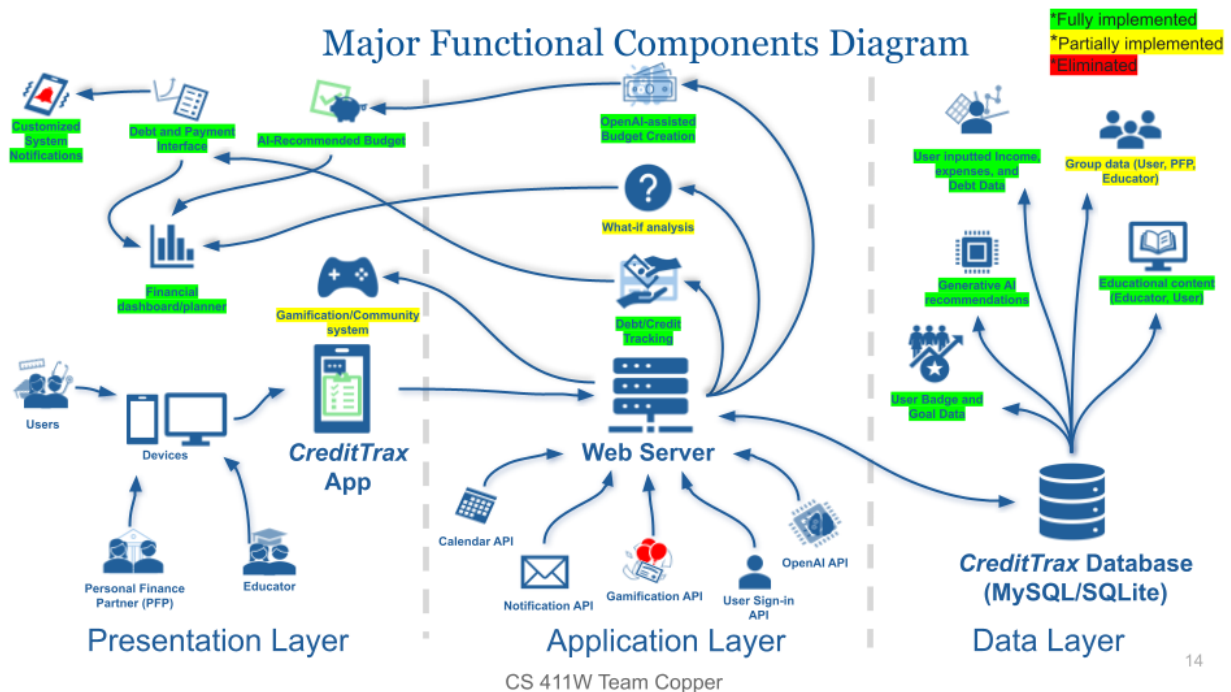
Frontend development utilizes web technologies like HTML5, CSS, and Alpine.js to craft a responsive user interface. TailwindCSS acts as our primary frontend framework, reducing the workload involved in writing extensive CSS stylesheets. For testing, Jest ensures code quality and reliability, while JSDoc is utilized to maintain consistent documentation throughout the codebase.

On the backend, PHP is our primary language, supported by the Laravel framework for project structure and data communications. To ensure robust code quality, PHPUnit and Scribe are used as our testing framework and documentation tool of choice.

Table 1

Development Tools

Development Tools

Development Type	Front-End	Back-end
IDE	VSCode	VSCode
Version Control	Github	Github
CI and CD	Github	Github
Language	HTML5, CSS, JS	PHP
Testing Framework	Jest	PHPUnit
Documentation Tool	JSDoc	Scribe

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For the database, a containerized version of SQLite is used to provide a reliable solution for storing system and user data, such as user profiles, budgets, debts, transactions, and badges. The SQLite database is containerized with Docker, preparing it for hosting on ODU's virtual machines. This approach ensures the secure and consistent availability of the project database for all team members during development.

Figure 2

Database Schema
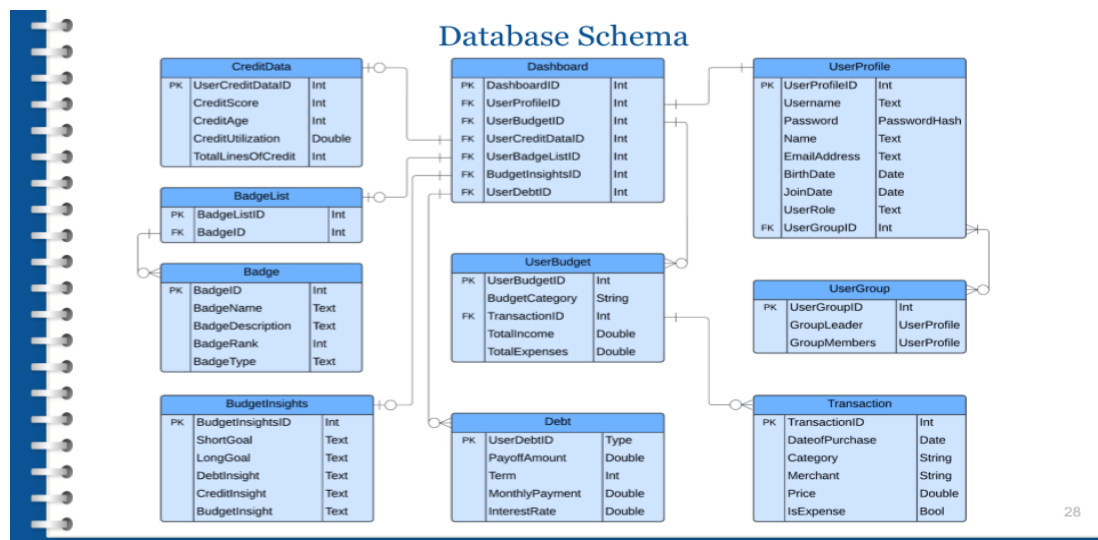
3   Identification of Case Study

CreditTrax is designed for young adults ages 18-34 who are new to managing their finances and want greater control over both their current and future financial health. This includes individuals currently struggling with student loans, credit cards, car payments, or any other form of financial obligation. Additionally, CreditTrax helps those looking for tailored financial recommendations on future savings, retirement planning, or What-If scenario insights.

Key user groups include young adults mentally overwhelmed by a lack of experience with personal finances, young professionals burdened by student loans and credit card debt, service members transitioning from service to civilian life, and recent graduates who lack financial literacy and are in need of budgeting support.

Although designed for individual users, CreditTrax has broader applications. Universities can use it to promote financial literacy, employers can integrate it into financial wellness programs, and financial institutions can leverage it to engage and support a younger demographic.

4   Glossary

Annual Inflation Rate: The percentage increase in the cost of goods over the course of a year.

APR (Annual Percentage Rate): The annual rate charged for borrowing money as a percentage of the total borrowed amount.

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.

Financial Management: The process of budgeting, saving, and monitoring personal finances to achieve one's financial goals.

Financial Uncertainty: The fear or concern about one's financial situation, often relating to income, debt, or future stability.

Student Loans: Money borrowed by an individual for educational purposes (for tuition, transportation, textbooks, etc.) which must be repaid with interest.

"What-if" Analysis: A technique that allows users to simulate various (financial) scenarios and visualize their potential outcomes.

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.

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