

Lab 1 – **CreditTrax** Product Description

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1 Introduction

For most people, debt is an unavoidable part of life. Most major life milestones require taking on some sort of debt – from getting your first credit card, to taking out student loans, to financing your first car, to having a child. While many people can navigate these obstacles safely on their own, many younger people who are just starting out on their own either lack the knowledge or the means to avoid taking on large amounts of high-interest debts and find themselves trapped in an endless cycle of payments.

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People just getting a start in their careers often end up saddled with debts, and just looking at pamphlets spread around the financial aid offices at every college will show you how. Student loans in the U.S. alone totaled over \$1.74 trillion by the second quarter of 2024, according to the Federal Reserve (Safier 2024). To put this into further perspective, the national debt of the entire country of Sweden totals only just over \$1 trillion (CEIC Data 2023). Paying off a country's worth of debt is a lot of ask of people who are just starting to learn to get around on their own, much less while they focus on other costs like rent and food using an entry-level income.

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Ultimately, the problem of financial literacy breaks down into three major components: a lack of education on how to budget and pay, a lack of planning, and a lack of clarity in how debt works. What people who struggle with finances need is access to solutions to these three obstacles: educational resources to teach them about budgeting, a planner to keep payments on schedule, and a resource to help translate financial jargon into something they can understand.

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CreditTrax helps by solving each part of the problem all in one place. To improve a user's education, CreditTrax will find and offer learning cues to help guide people toward resources that will best help them learn how to budget and pay. To improve a user's planning, CreditTrax will badges to help give a user goals to strive toward, as well as offer custom notification settings

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that will help users remember to pay bills on time. To demystify debt for a user, CreditTrax will use custom learning algorithms to create visual references that allow users to actually *see* how their actions will affect their debts, ranging from graphs of how past payments helped to what-if projections to help visualize what future payments can affect.

In the end, all of us working on CreditTrax realize that debt is a large problem to conquer all at once. However, we also believe that by taking steps and breaking the problem down into bite-sized pieces, we can help people make progress at a pace that works best for them.

2 CreditTrax Product Description

At its core, CreditTrax is an application designed to guide its users toward financial success. It does this by using a combination of tools: notifications to keep users on top of payments, rewards to motivate users to develop good habits, and educational resources to help users learn more about the way finance works. By giving users access to resources to help themselves, we aim to teach them how to think and act for themselves when it comes to important financial decisions.

While these goals sound good in general... it also sounds like a million other financial apps that already exist on the market. What makes CreditTrax different? Essentially, we aim to integrate the use of Artificial Intelligence and data visualization into the financial space to help generate and test new payment plans on the fly. By integrating both hard-coded algorithms and an OpenAI chatbot, we also give our users the option to test both tried-and-true and innovative AI-recommended budgeting methods. Developing what-if visualizations allows users to actually see how they can control their finances, rather than trying to decode a bunch of numbers on a screen for themselves.

2.1 Key Product Features and Capabilities

The key features of CreditTrax start with the first screen that will be pulled up whenever someone logs in to the app – the user dashboard. The dashboard allows a user easy access to all the other features and will inform users about their current financial health with a quick glance. Users will be able to see their current debt, badge progress, educational resources, and upcoming payments on the home screen, along with links to CreditTrax’s other tools like What-If Analysis and Budget Recommendations.

CreditTrax will also allow for a fully customizable notification system to allow users to remind themselves to make payments on time. Notification frequency is set by the user and can vary from a friendly reminder once around payment time to a persistent badge that can only be turned off once confirmation of a payment is made. Should a user miss a payment, the app will also recommend that the user raise the frequency of their notifications to help prevent subsequent late payments.

CreditTrax will also integrate both the use of Artificial Intelligence (AI) and hard-coded algorithms to offer budgeting recommendations to create a payment schedule. AI budgeting with OpenAI is optional and will be activated using a toggle on the budgeting page. The user can run either the hard-coded or the AI budgeting tool at one time, or both at the same time to compare the two methods to see which works better for their personal financial situation.

What-If Analysis will also be a major feature of CreditTrax and allows users to project budget recommendations outward into the future to see how different payment methods and schedules will affect their debt payoff progress. The budgets recommended using the budget recommendation tool can be loaded here, or the user will be able to enter their own custom payment amounts and payment schedule to test their own knowledge against the

recommendations of CreditTrax. There's a couple of reasons this works well for the user: it allows the user to test what they've learning from the educational tools, while also giving the user more agency in their decisions once they feel more comfortable with testing themselves.

CreditTrax will also serve as a resource for its users to access materials to improve their financial knowledge. OpenAI chatbot integration will help serve as a quick reference resource for users who choose to use AI recommendations, while human educators will also be allowed to sign up to take on and help groups of students improve their finances. There will also be basic baseline materials made available to help users who are just starting out get off on the right foot toward paying off their debts.

The badge system exists as a motivator for the user and will help users develop good financial habits by giving them goals to strive toward over time. By splitting progress into clear, obtainable steps, users will be less intimidated by their current situation and can focus on making progress rather than being overwhelmed by taking on the whole amount at once. Badges also allow a more secure, private way for educators to track the progress of their students without giving full access to their students' financial information. And educator can see from a glance that a certain student has earned a few badges over the last month and tell that progress was made, or see that nothing changed and know that one of their students is struggling and needs additional help.

2.2 Major Components (Hardware/Software)

CreditTrax will be primarily an application developed for mobile devices, with desktop support likely to come in future releases. The initial design will be designed with touch controls in mind, with larger buttons and on-screen keyboard support for the user to input their

information. Since most of the tools will require web connectivity, an internet connection will be required upon release with offline support not yet offered.

Primary design of the application and its data flow will be based mostly off of the following functional components:

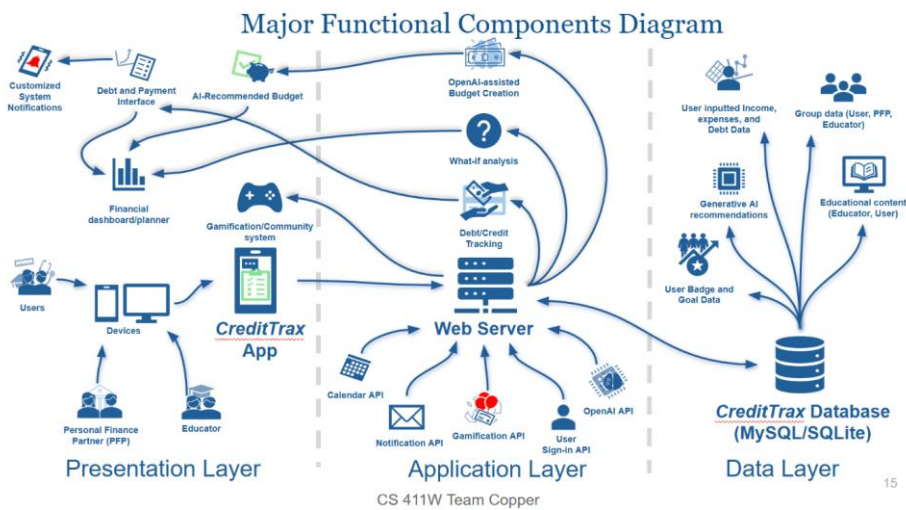


Figure 1: Major Functional Components Diagram

Starting in the Presentation layer, users will access the application using their personal devices. As mentioned before, the application is being developed initially for mobile devices, using Laravel as a framework to form our application's design. This layer is also where we will implement our application's Dashboard, allowing links to access all other features aggregated into one place. Presentation also allows the application to communicate with the user using notifications, currently planned to be done by linking to a user's Google Calendar and setting up reminders using the Google Calendar API.

The application layer is where much of the work is done internally. Currently, our plan is to use PHP to build much of the back-end algorithms and scripts, and which will allow us to

develop ways to create and store budgets, implement our what-if analysis, and implement our gamification system for badges. Currently, we plan on using OpenAI's chatbot API to form the basis of our AI integration to the system, and GameLayer as a way to form the basis for the badge system. The Google Calendar API will also be supported on this layer, while actively communicating with the user on the Presentation layer.

The Data Layer is where all our database information will be handled. We currently plan to use Docker to connect to a Virtual Machine hosted by Old Dominion University, with SQLite as the database language to store and retrieve user financial data. We can also store user educational resources, groups, and financial data in this database for easy retrieval for analysis.

3 Identification of Case Study

[WIP]

4 Conclusion

[WIP]

5 Glossary

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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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