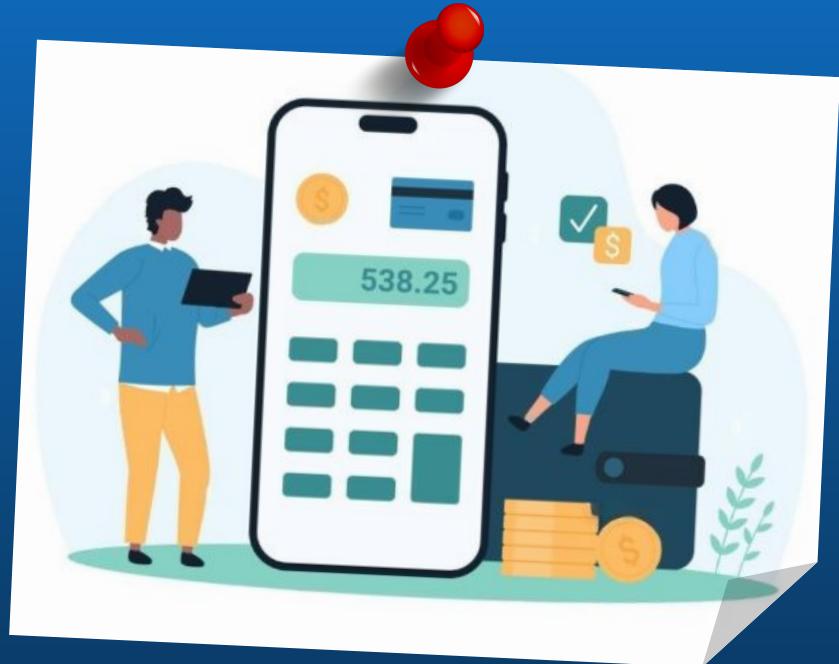


# CreditTrax

*Empowering Young Adults for Financial Success*

Feasibility Presentation  
By Team: Copper  
Old Dominion University  
CS 410  
Fall 2024



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# Meet the Team



Darrick Allen  
Webmaster /  
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Brian Nguyen  
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Josh Martin  
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# Financial Stress

A life-altering issue for young Adults

Young adults often feel trapped by financial uncertainty. With limited experience in an increasingly hostile financial world, many are mentally overwhelmed by student loans, credit card debt, and the constant struggle to meet basic needs—all while trying to build a successful future.

I'm sure at one point we've all felt the **Stress** of:

## Unexpected Expenses



## Busy Schedules



## Bills piling up



# Can Relate?



Ever found yourself in a financial situation you couldn't afford? This could be an unexpected medical bill, a costly car repair, or overspending during the holiday season for a gift for a love one. **Just trying to make ends meet!**

Young adults often navigate a challenging financial landscape marked by significant student loan debt, limited entry-level incomes, and high living costs. Some struggle with housing affordability, leading to shared accommodations or living with parents, while credit card debt becomes a tempting yet risky solution for immediate purchases. **We have all been there!**

Much of this stems from a lack of financial education and a clear vision of how today's decisions will affect their future.

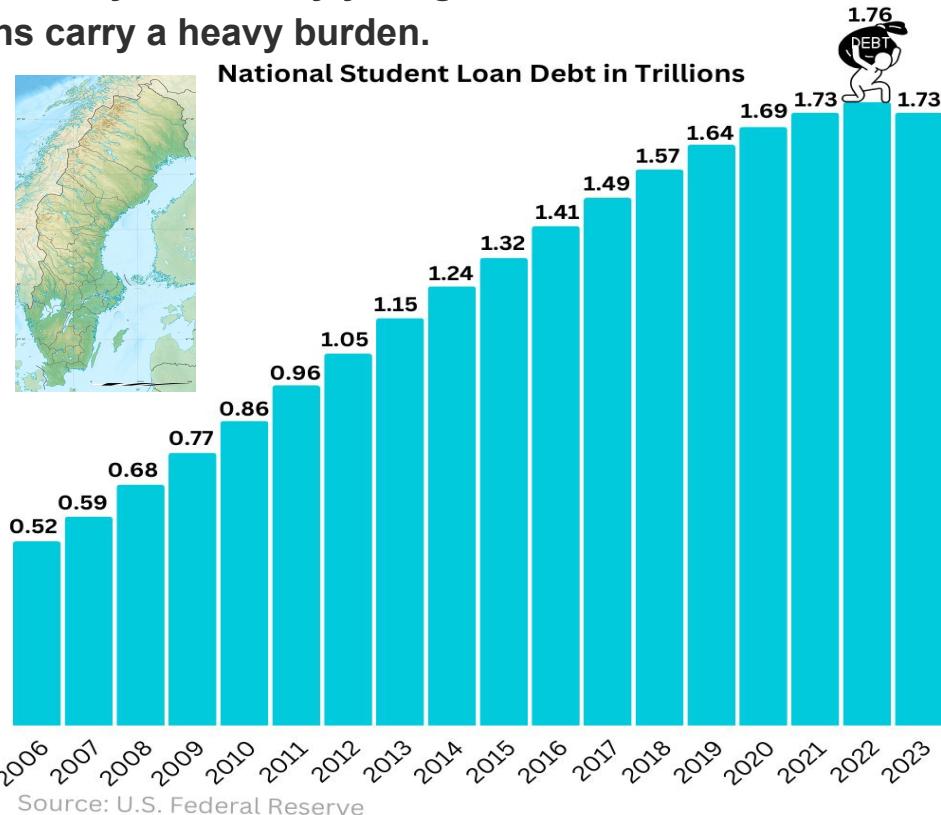
Interesting Fact: In 2024, student loan debt in the U.S now totals more than \$1.74 trillion, and approximately 60% of college graduates leave school with student loan debt.<sup>13</sup>

# A Financial Crisis for Young Adults

Proper finance management is key to success in life, yet for many young adults, increasing credit debt and student loans carry a heavy burden.

## In The USA

- ❖ U.S Consumers owe over \$1 trillion in credit card debt.<sup>6</sup>
  - Roughly equivalent to Sweden's national debt.<sup>14</sup>
- ❖ Credit card debt raised by 14.3% among Gen-Z (ages 18-29) between 2022-23.<sup>6</sup>
- ❖ 9 in 10 borrowers report experiencing significant anxiety due to their student loan debt.<sup>4</sup>
- ❖ The national student loan debt balance has risen by 66% in the last decade.<sup>13</sup>



# The Hidden Cost of Debt

- How a lack of financial education and clarity harms the present and future of young adults.

## ❖ Mental Health

- Those in debt are twice as likely to experience depression and anxiety.<sup>11</sup>
- 16% of suicides are linked to financial trouble.<sup>11</sup>

## ❖ Delayed Milestones

- Marriage, starting a family, and buying a house are often delayed due to debt burdens.<sup>11</sup>

## ❖ No Thought of Retirement:

- 30% of adults age 25-34 have absolutely no money saved for retirement.<sup>3</sup>

## ❖ Struggle to Meet Basic Needs:

- 36% of young adults (age 18-24) have trouble meeting basic needs.<sup>8</sup>



## More Than One in Three Young Adults Had Trouble Meeting Basic Food Needs

Share of adults ages 18 to 24



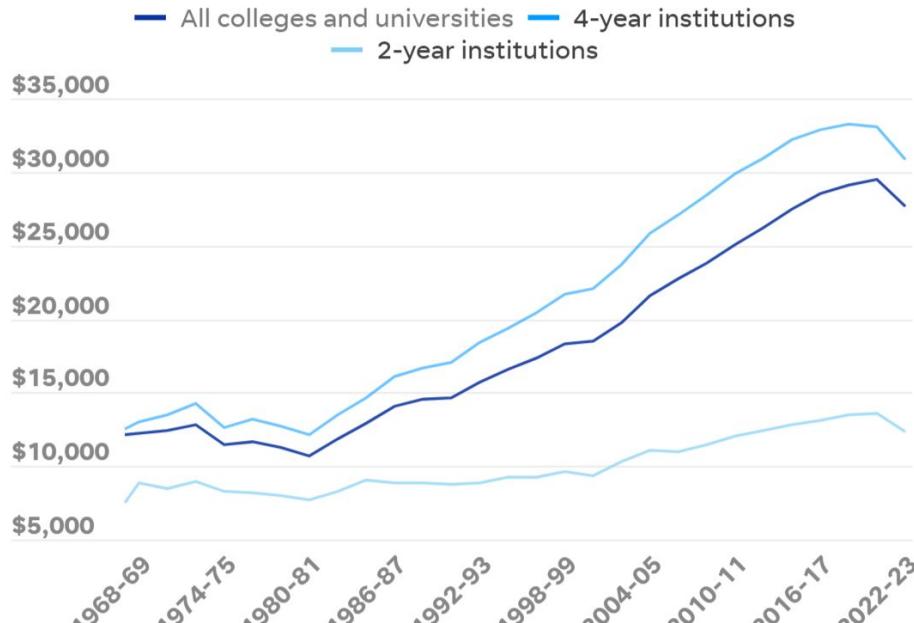
Source: Well-Being and Basic Needs Survey. December 2023.

URBAN INSTITUTE

# Why Are Young Adults Struggling With Debt?

- ❖ **College Tuition More Expensive Than Ever**
  - Adjusted for inflation, On campus student tuition has over doubled since the 60's.<sup>2</sup>
- ❖ **Rising Inflation**
  - A 40 year high annual inflation rate of 9.1% was recently reached in 2022, making everything more expensive, including the debt.<sup>10</sup>
- ❖ **Soaring Credit Card Interest Rates**
  - The APR on credit cards has nearly doubled from 12.9% in 2013 to a record 22.8% in 2023, further increasing the financial burden on young adults.<sup>7</sup>
- ❖ **High Cost of Living in Crucial Areas**
  - Major urban areas, where many young adults find work, have some of the highest cost of living.<sup>15</sup>

Average cost of tuition fees, room and board by institution  
In 2022-2023 dollars



Source: USA Today, data from the National Center for Education Statistics (NCES)

## Our Problem Statement

Many young adults in the U.S. struggle with their finances due to the overwhelming burden of student loans, ever increasing credit rates, and a lack of experience with crucial financial skills.

Balancing the pressures of starting a career, taking care of themselves and loved ones, all while facing financial uncertainty leads to the accumulation of debt, increased anxiety, and delayed life milestones such as marriage, home ownership, and starting a family.



# The Problem Characteristics

Forgetting to pay monthly payments due to being busy

- ❖ Interest rate increase
- ❖ Takes even longer to pay it off
- ❖ Late fees
- ❖ Credit score sinks
  - Harder time making large purchases
- ❖ Mental and physical health decline
- ❖ Harder time achieving life goals.

Lack of proper budgeting skills and/or financial literacy

- ❖ Can't make realistic budgets
- ❖ Won't know where their money has gone
- ❖ Harder time prioritizing expenses, short-term and long-term goals
- ❖ Won't fully understand the impacts of late payments and general financial choices

Some apps have budget management features, some have debt management, not many have both

- ❖ May have to use at least two financial apps.
- ❖ Harder to manage finances
- ❖ Hard to see the bigger picture



# Who is Affected?

## Users

- ❖ **Young Professionals** overburdened by student loans and credit card debt.
- ❖ **Students and Recent Graduates** lacking financial literacy and seeking budgeting support.
- ❖ **Young Adults** (18-34) mentally overwhelmed by a lack of experience with finance.
- ❖ **Service members** transitioning from military to civilian struggling managing finances



## Customers

- ❖ **Young Adults**
- ❖ **Financial Institutions** looking to partner with apps to better serve a younger audience.
- ❖ **Employers** looking to offer financial wellness programs for early-career employees.
- ❖ **Universities** that want to offer an educational finance tool for students to learn personal finance



## Stakeholders

- ❖ **Financial Advisors** with an interest in helping young adults build sound financial habits
- ❖ **Financial Wellness Coaches** providing educational services to young adults to reduce debt and improve budgeting skills.
- ❖ **Credit Counselors** looking for tools to suggest to their younger clients.



# Current Process Flow

## Legend

Start



Area of frustration



Obstacle



Outcome



Good ending



Bad ending



Expense management

Person wants to clear debt and manage expenses

Know how much they spending?

No

Track a month's expenses

Yes

Spending too much

Debt management

Have debt in multiple places?

Making monthly payments?

Yes

Log in account

Pay monthly payment

Have debt in another place?

No

Done with monthly payment

Yes

Have a budget?

No

Know how to make one?

Yes

Research budgeting

Yes

Adjust budget

No

Create budget manually

Yes

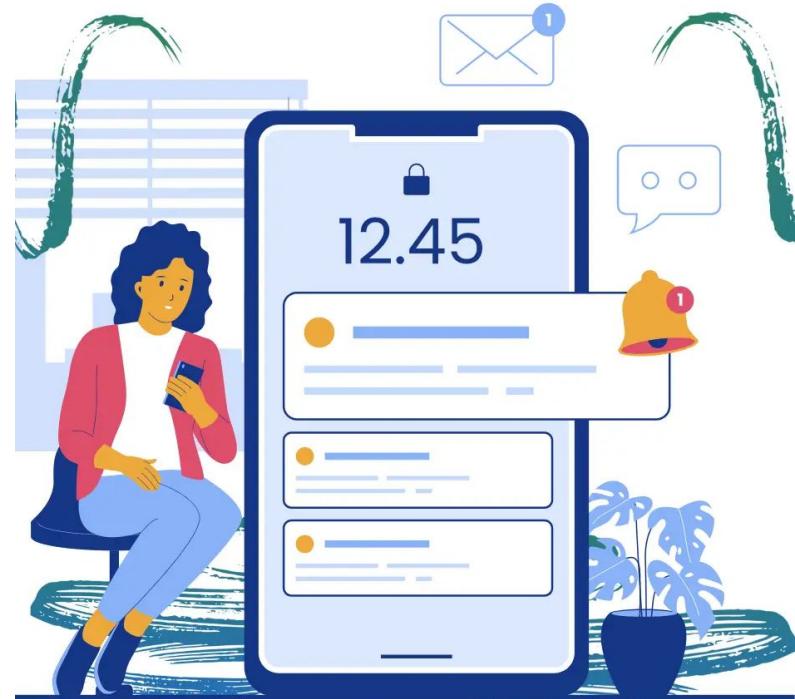
Expenses managed

CS410 Team Copper Feasibility

# Our Solution: *CreditTrax*

CreditTrax leverages AI-powered budgeting through personalized financial dashboards and interactive tools to help users align their spending with long-term financial goals while making smarter financial decisions.

By analyzing spending habits, sending real-time notifications, and offering comprehensive financial literacy tools, CreditTrax enables young adults to achieve their financial objectives, track their progress, and reduce the stress and anxiety that often comes with managing debt.



# Solution Characteristics

## Debt Tracking

- ❖ Designed to give users a clear, organized view of their financial obligations
- ❖ Users can **input all their debts** e.g. credit card balances and student loans along with their respective interest rates and due dates
- ❖ **Smart Payment Reminders -** Prompts the user to **manually approve payment** of a debt. If they neglect to do so, the app will issue increasing reminders to ensure that they pay their debts on time.



## Budgeting Recommendations

- ❖ Powered by **AI** to provide personalized recommendations based on a user's debt and spending habits
- ❖ Analyzes the user's income, expenses, and debt obligations to generate tailored suggestions to help them optimize their budget
- ❖ Reduces unnecessary spending and allocate funds more efficiently

For example:

If a user is just starting out in their career and is burdened with multiple loans, the app might suggest the **50-30-20** budget plan.

(50% for needs, 30% for wants, and 20% for savings and debt payments )

## Personal Financial Dashboard

- ❖ **Data analytics** - tracks and analyzes users' spending habits, debt obligations, and income flow over time, allowing the dashboard to offer real-time visualizations and reports on financial health.
- ❖ **Visualization** - Makes use of charts/graphs and badges to illustrate the user's progress with their debt. It allows users to easily monitor their spending in relation to their debt obligations.
- ❖ Encourages users to stay motivated to adhere to their budget and debt repayment plans.
- ❖ **"What-if" analysis** - This feature enables users to explore potential financial outcomes by simulating different scenarios, such as increasing loan payments or adjusting their savings, helping them make informed decisions based on projected results.

e.g. For users who manage to make every payment before the due date for 6 months straight.



# Solution Characteristics

## Financial Literacy

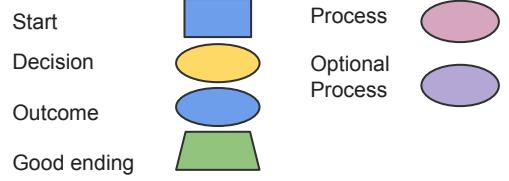
- ❖ **Builds essential financial skills:** CreditTrax educates users on key financial concepts like budgeting, saving, and managing debt, which are crucial for young adults who may lack experience in these areas.
- ❖ **Encourages proactive financial habits:** The app fosters good financial habits by teaching users how to balance debt payments with saving goals, enabling them to take control of their finances early in their careers.
- ❖ **Reduces financial anxiety:** By improving financial literacy, CreditTrax empowers young adults and alleviates the stress of managing their finances, which is especially important for recent graduates (and young adults alike) facing student loans and credit card debt.

## Short vs Long-term Goals

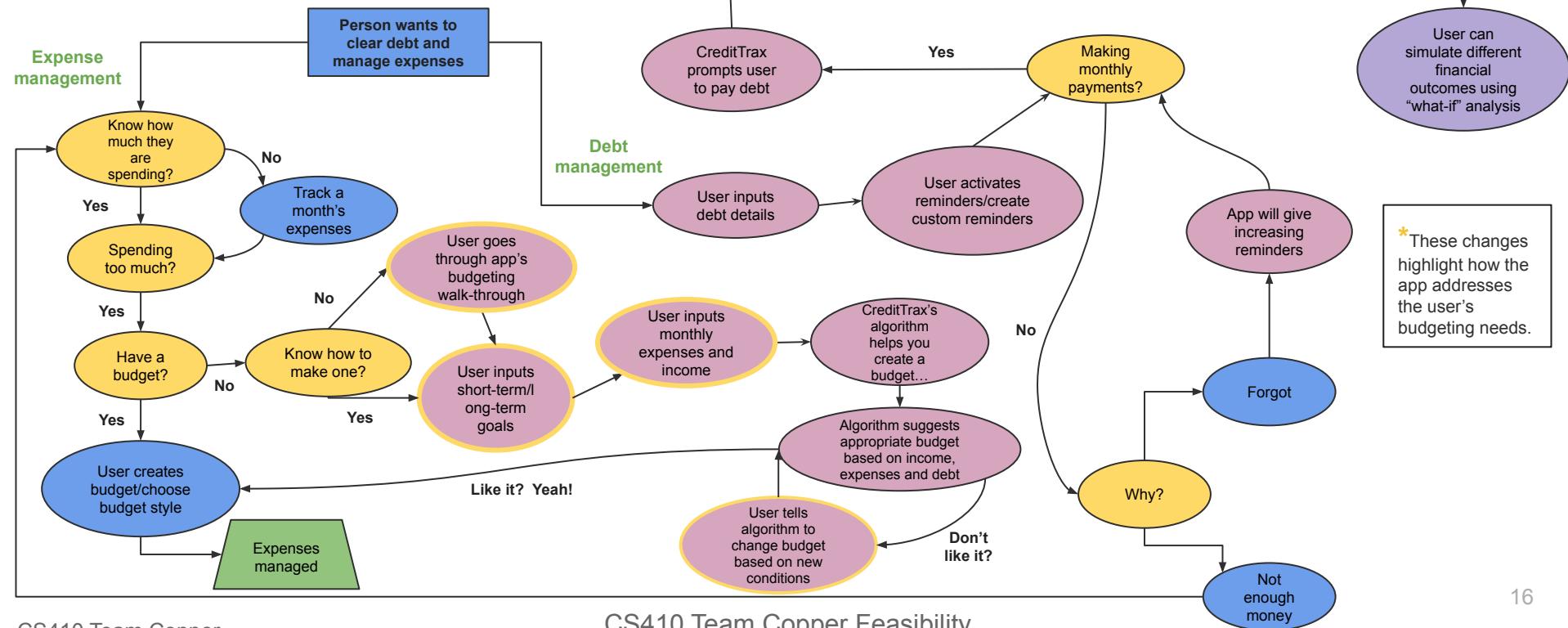
- ❖ This app offers the user the flexibility of choosing between setting short-term or long-term goals to suit the user's changing needs.
- ❖ They can choose from a list of options or define their own goals, e.g. short term: building an emergency fund or eliminating debts and long term: buying a house or a car.



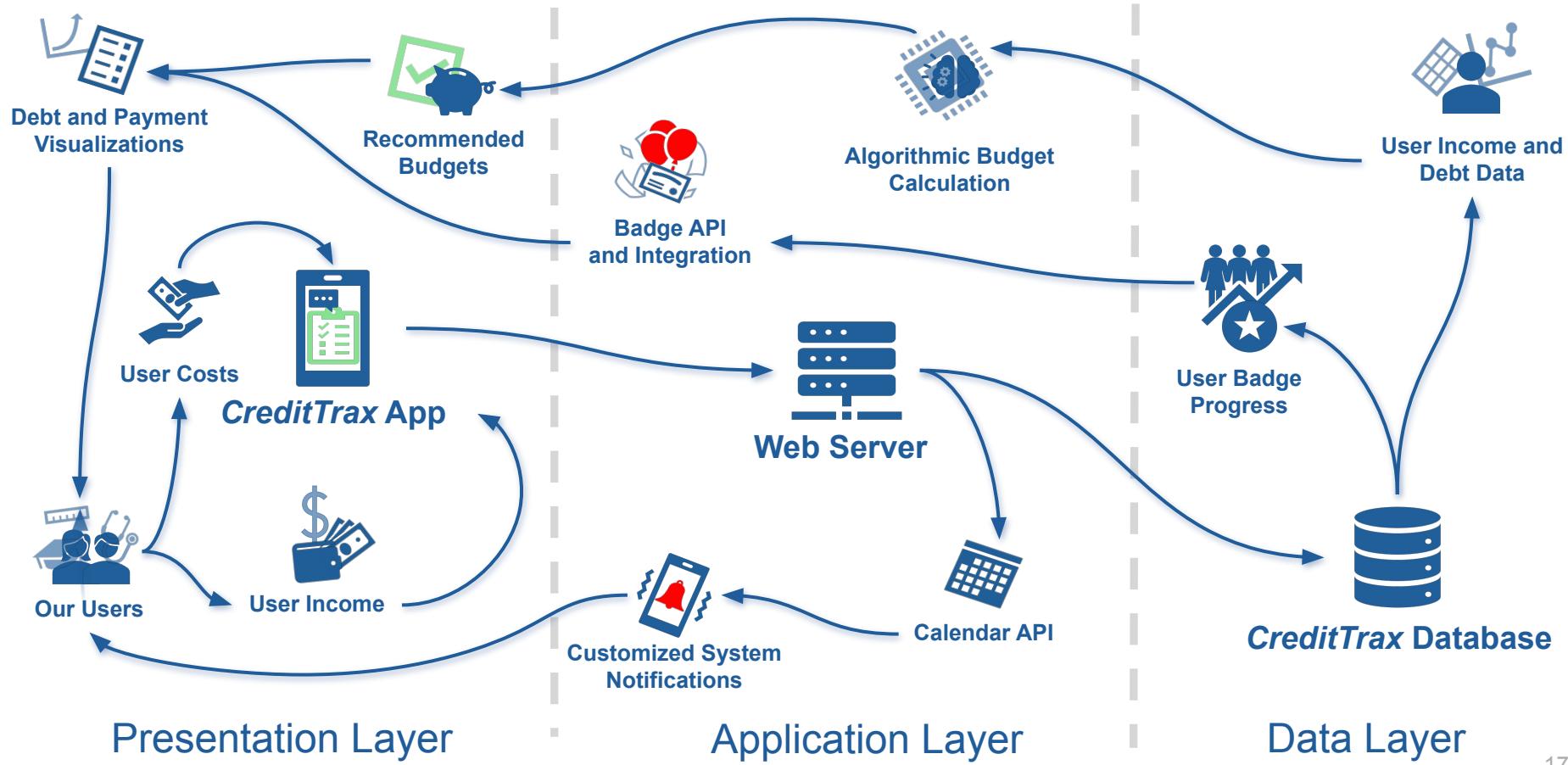
## Legend



# Solution Process Flow



# Major Functional Components Diagram



Presentation Layer

Application Layer

Data Layer

# Development Tools

Development Type	Front-End	Back-end
IDE	VSCode	VSCode
Version Control	Github	Github
CI and CD	Github	Github
Language	HTML, CSS	Python
Testing Framework	Mocha	Pytest
Documentation Tool	Sphinx	Pydoc

# Required Libraries, Tools, & Technologies

## ❖ Libraries

- Sci-kit learn (Python)
- Numpy (Python)
- Pandas (Python)

## ❖ Tools

- Django: Framework for Python
- Bootstrap: Framework for HTML
- MongoDB: Database program

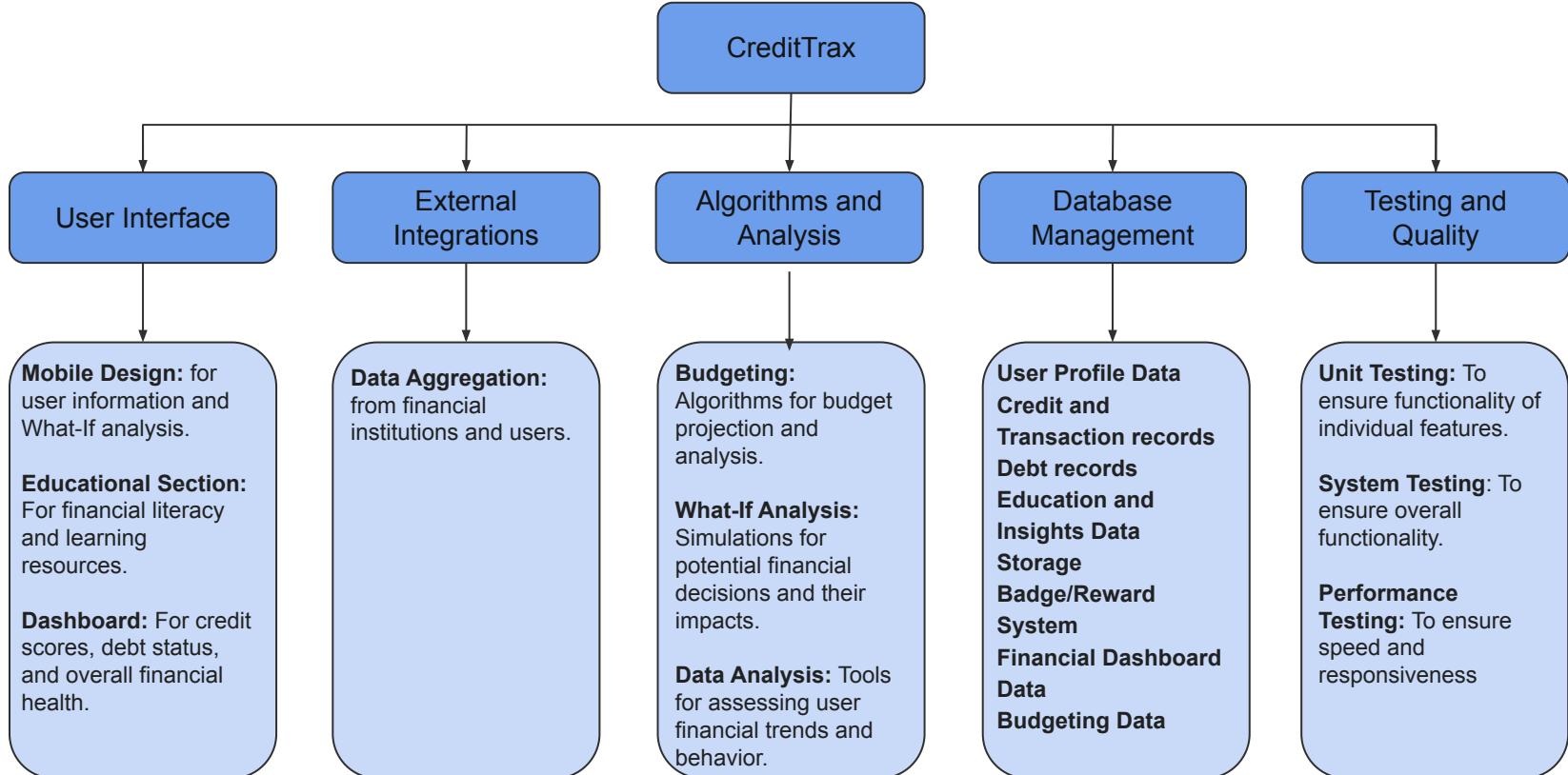
# What CreditTrax Will Do

- ❖ Track debt and manage budgets all in one place.
- ❖ Allow customized notifications tailored to user preferences.
- ❖ Visualize the user's personal debt journey using graphs, charts, and badges.
- ❖ Offer what-if analysis and educational resources for users who wish to take learning further.
- ❖ Motivate users to develop good financial habits and improve their financial health.
- ❖ Keep the user's personal information secure.

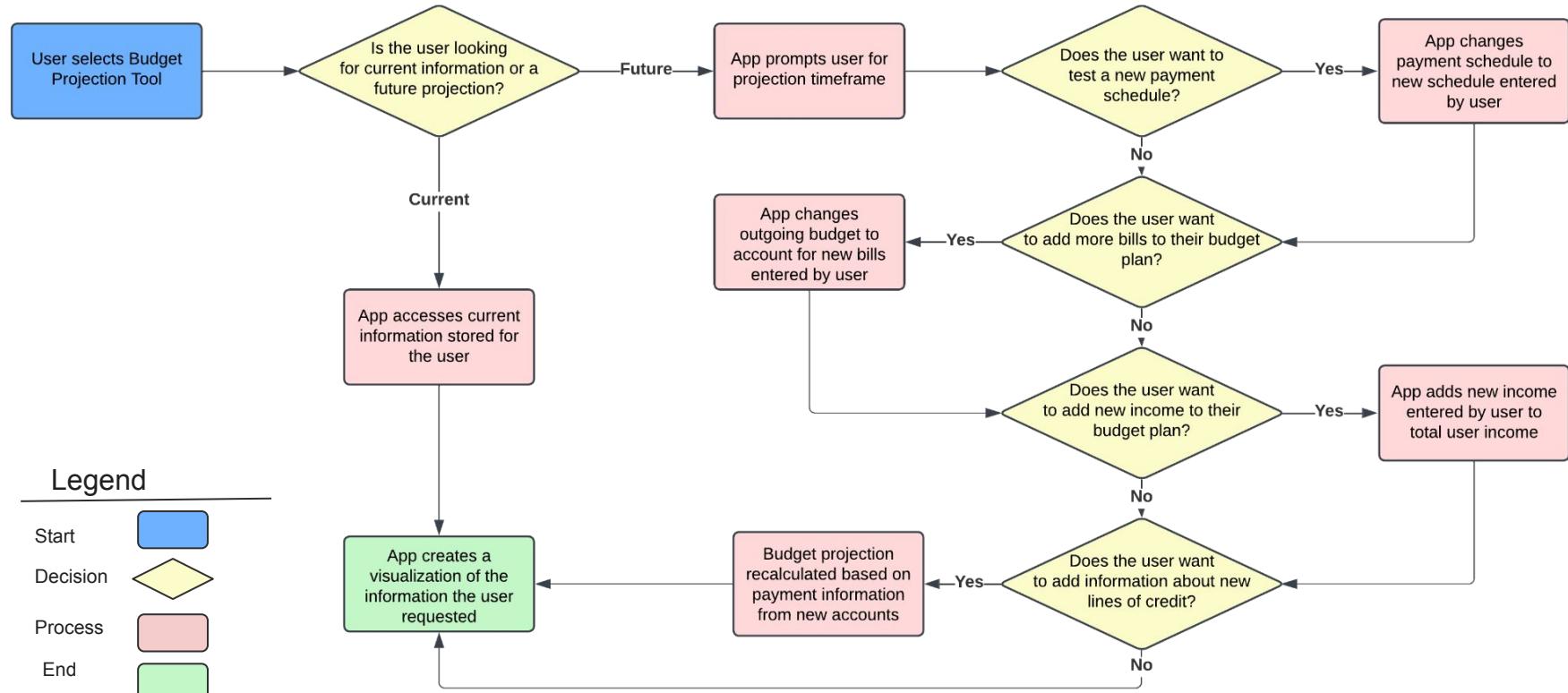
# What CreditTrax Will Not Do

- ❖ Directly change credit scores:
  - CreditTrax will not pull or report credit information to individual credit agencies, but will offer what-if analysis to see the impact payments *could* have on score.
  - CreditTrax will not pay bills by itself, but helps develop a payment schedule and uses reminders to help teach the user pay on their own.
- ❖ Lend you money to pay bills:
  - CreditTrax will not create new lines of credit for the user, but will help budget based on income the user already has.
- ❖ Share information with anyone other than the user.

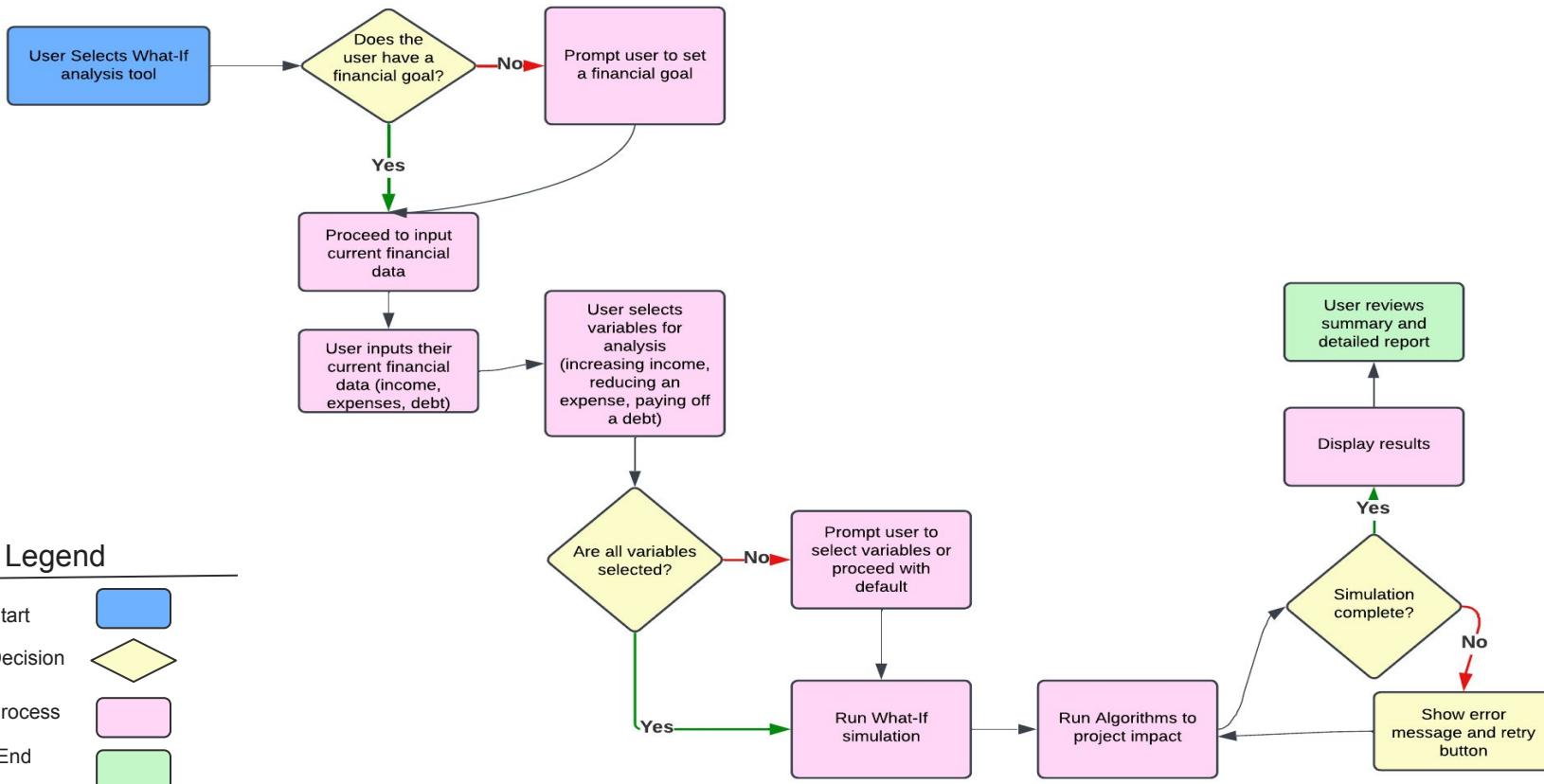
# Work Breakdown Structure



# Budgeting Analysis and Projection Algorithm

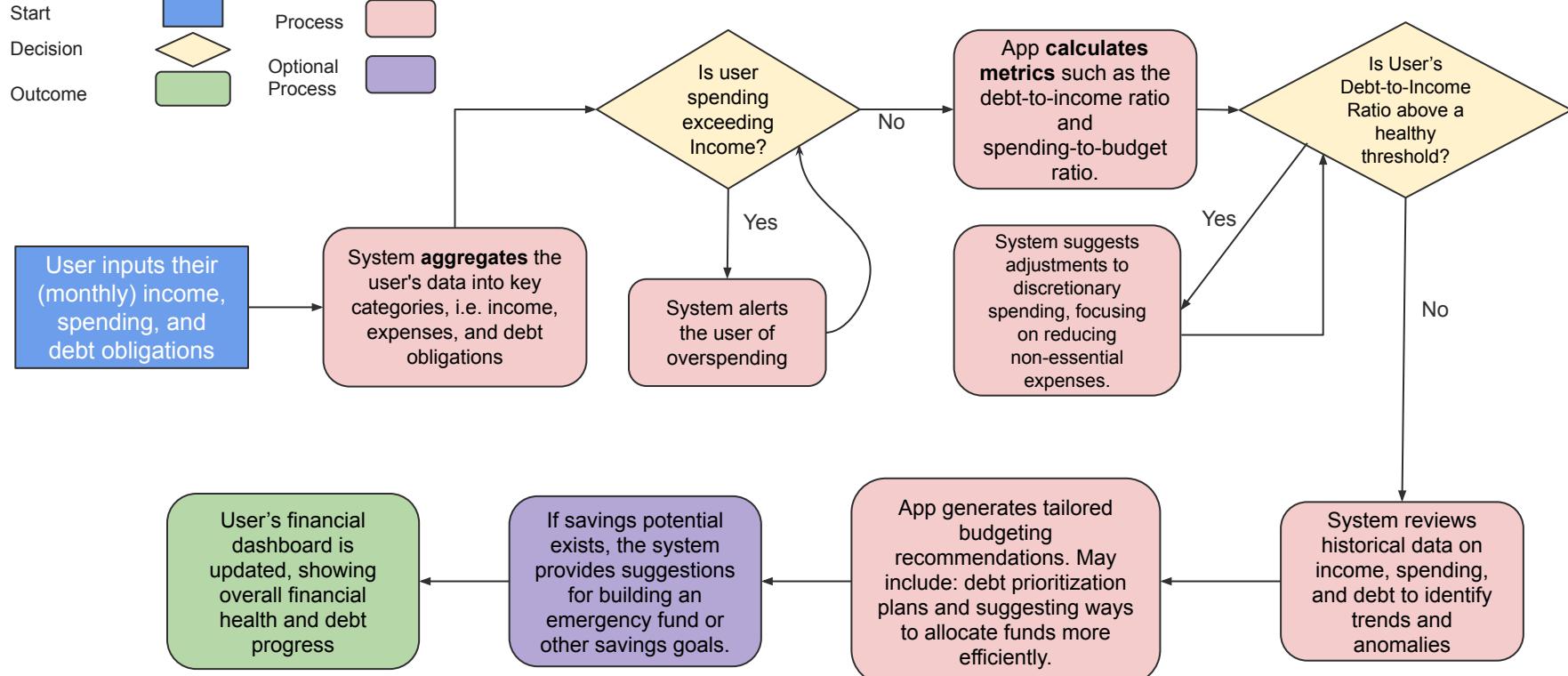


# What-If Analysis Algorithm

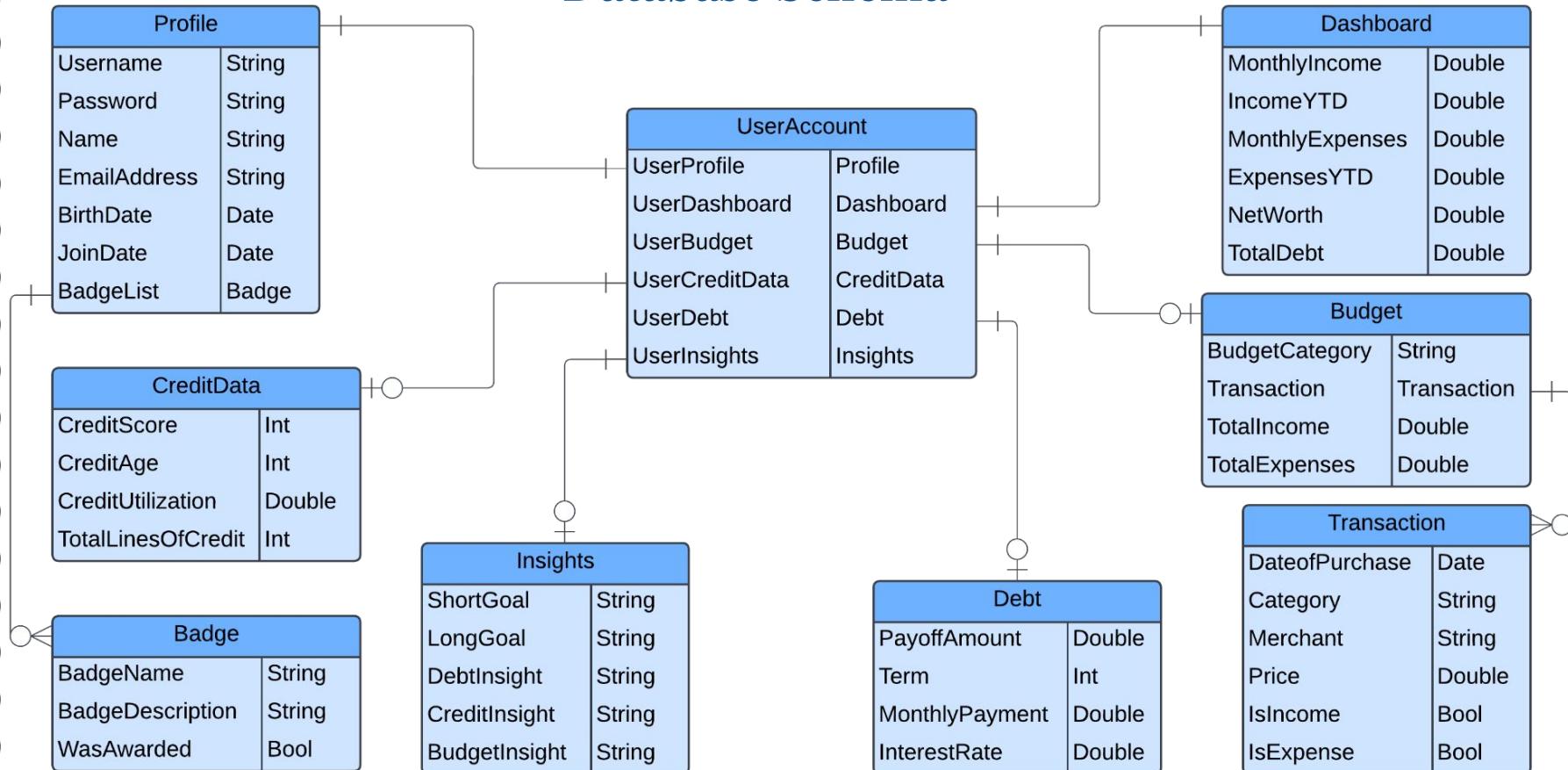


# Financial Data Analysis Algorithm

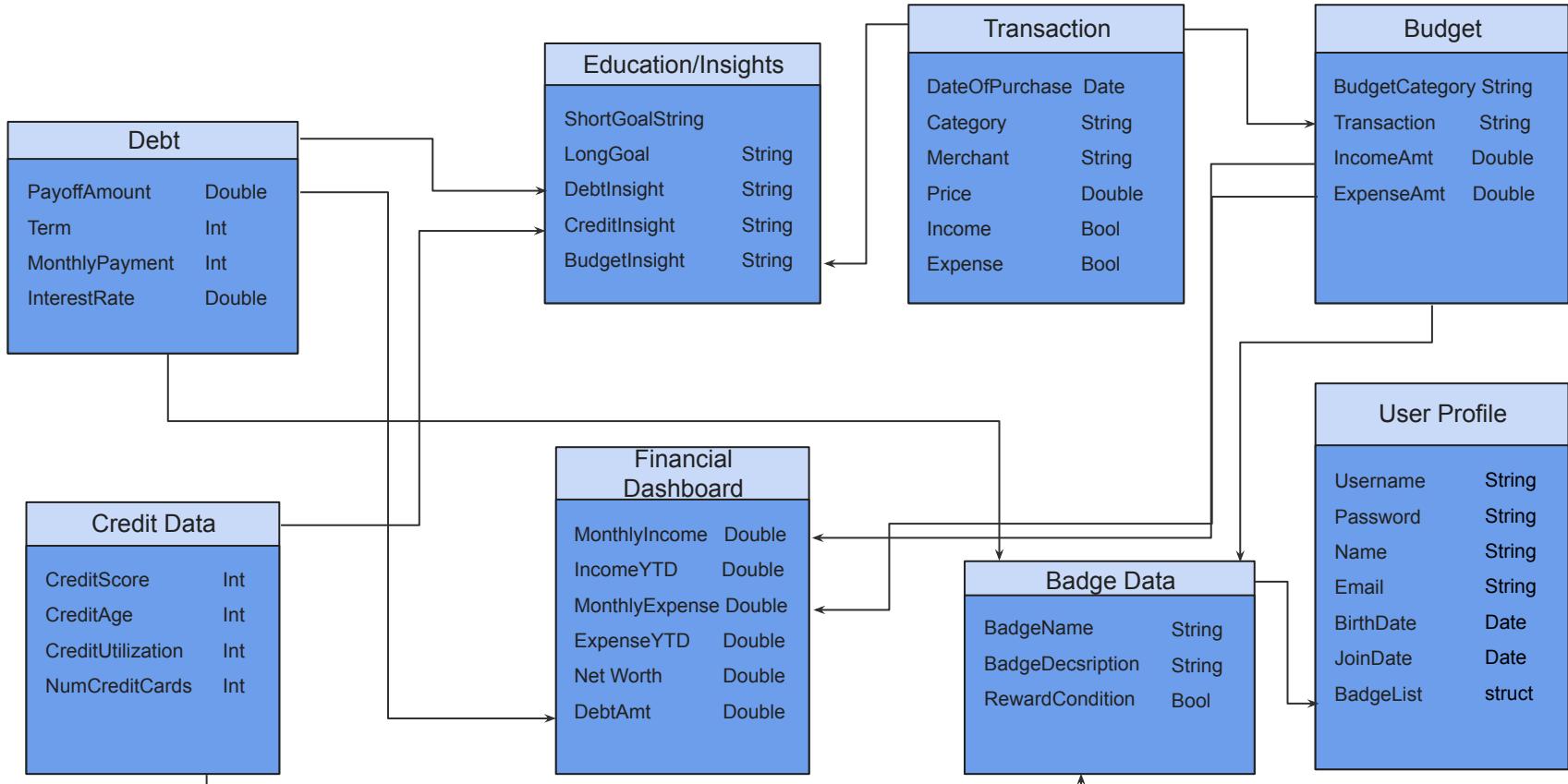
## Legend



# Database Schema



# Database Schema



# Real World Product vs Prototype

Feature	Real World Product (RWP)	Prototype
Debt Tracking	Full debt and payment visualization for all debts	
Budgeting Recommendations	AI-driven personalized budgeting recommendation	
Payment Reminders	Customizable reminders with increasing prompts	
Financial Dashboard	Comprehensive dashboard with charts and reports	
What-If Analysis	Scenario analysis for various financial outcomes	
Financial Literacy Tools	Full Education resources on debt, budgeting, etc.	
User Data Security	AES-256 encryption, MFA, and regular audits	
Goal Setting	Options for both short- and long-term financial goals	
Reward system	Badges rewarding user of accomplishing good habits and/or goals	

# Our Competition

Feature	CreditTrax	EveryDollar	YNAB	Credit Karma	Rocket Money
Debt and Income Tracking	✓	✓	✓	✓	✓
Debt and Payment Visualization	✓		✓	✓	✓
Budgeting Suggestions	✓	✓	✓		✓
Upcoming Bill Payment Reminders	✓				
Badges to Track Progress	✓				
Personalized Recommendation System	✓				

*Where CreditTrax can help!*

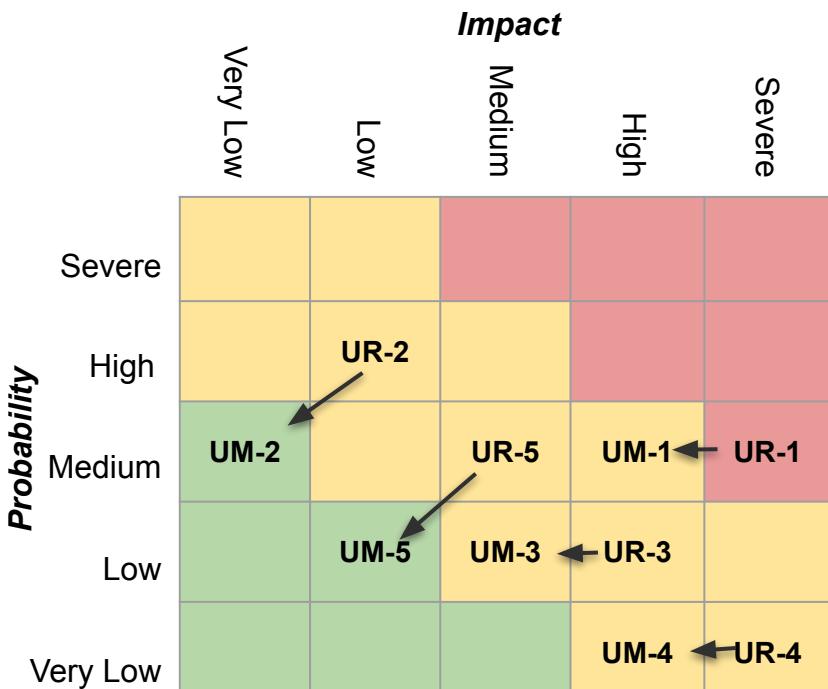
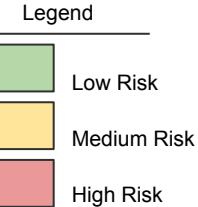
## User Risks

- **UR-1:** The tool's UI is too complicated, making data entry, tracking, and real-time management difficult and prone to errors.
- **UR-2:** User forgot to respond to CreditTrax when the monthly bill was paid.
- **UR-3:** User noticed that a feature is buggy or partially functioning.
- **UR-4:** User's app crashed
- **UR-5:** User finds their current budget style unsatisfactory.

## Risk Mitigation

- **UM-1:** Simplify the UI to enhance user experience, making data entry and tracking more intuitive and reducing the likelihood of errors. Provide tutorials or guided walkthroughs to help users navigate the app effectively.
- **UM-2:** Asks users if they paid the bill the next time they open the app.
- **UM-3:** User can send a bug report and developers will patch the bug.
- **UM-4:** User will be notified for reason of crash and can send a crash report to developers.
- **UM-5:** CreditTrax can advise user another budgeting technique (50/30/20, zero-based, etc.)

# User Risks



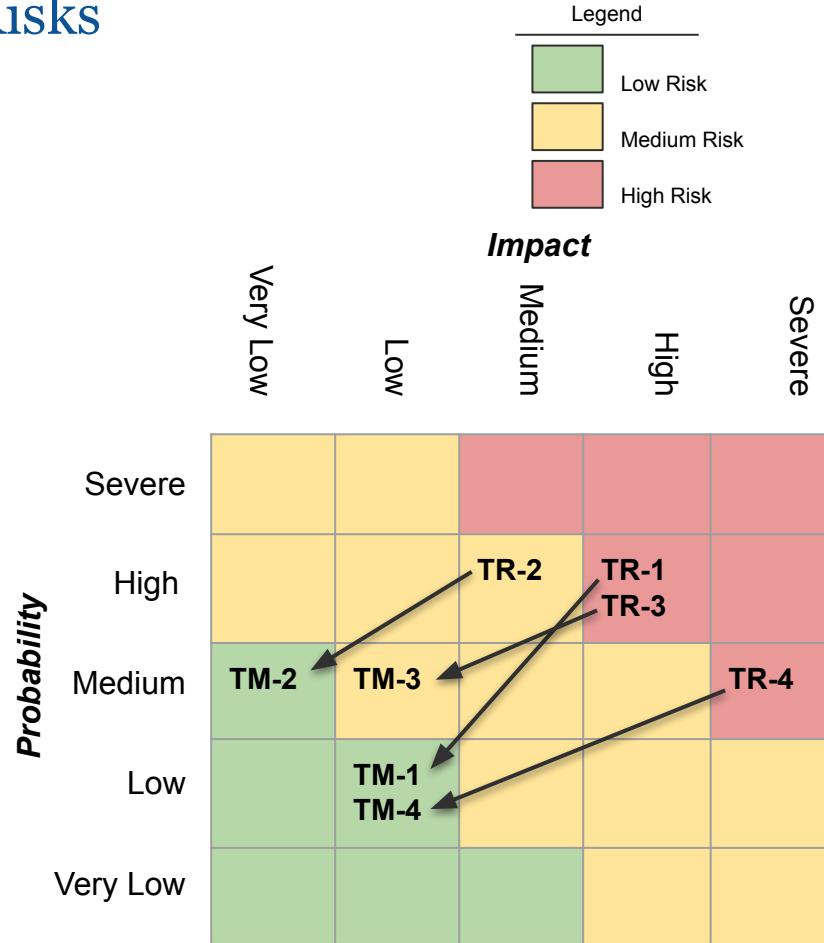
# Technical Risks

## ❖ Technical Risks

- **TR-1:** Integration of AI-driven budgeting recommendations and multiple features that can be complex
- **TR-2:** Ensure the app runs smoothly across different smartphones, operating systems, and versions.
- **TR-3:** Issues with handling concurrent users or processes at one time that also may make the application struggle to scale effectively.
- **TR-4:** The developed solution may not fully meet users' actual needs, leading to potential disengagement with the app.

## ❖ Risk Mitigation

- **TM-1:** Break down the development process into smaller, manageable tasks; using modular architecture and thorough testing.
- **TM-2:** Develop a robust compatibility testing plan that covers a wide range of devices and OS versions.
- **TM-3:** Implement concurrency control mechanisms and perform load testing with the use of scalable infrastructure and cloud services
- **TM-4:** Engage with end-users throughout the development process through surveys and interviews, and implement regular updates and feedback mechanisms to keep users engaged.



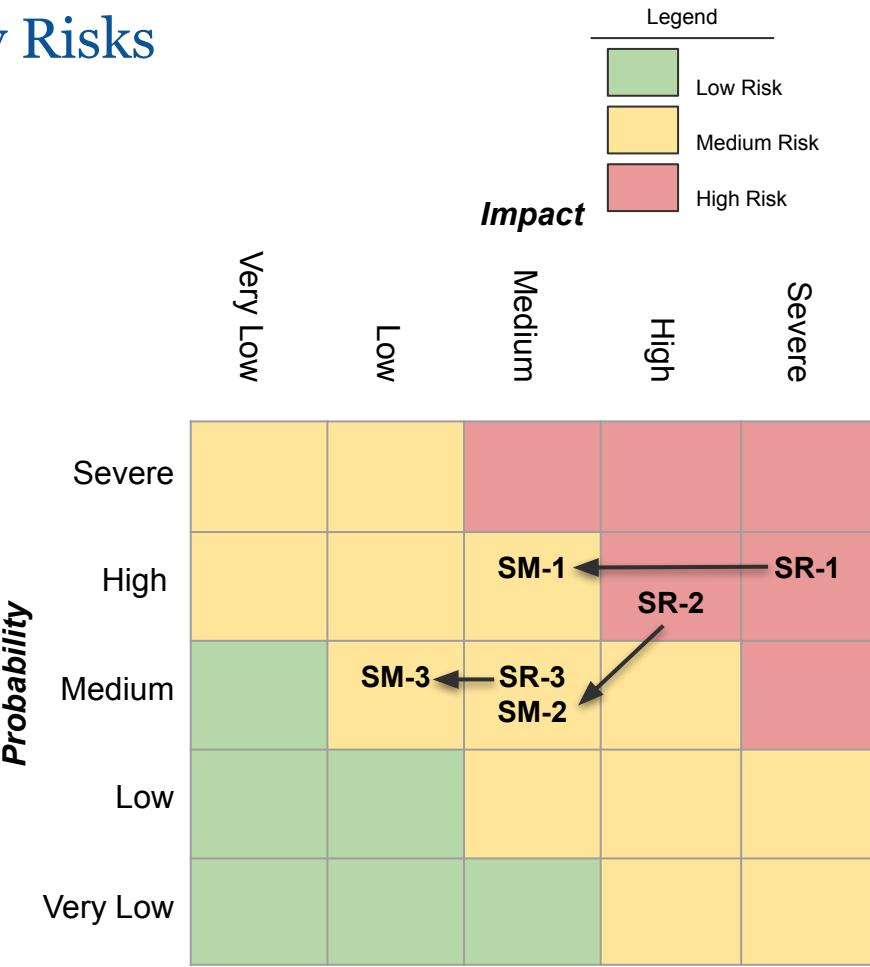
# Security Risks

## ❖ Security Risks

- **SR-1:** Risks related to data breaches, leading to unauthorized access to user's sensitive financial information.
- **SR-2:** Weak encryption mechanisms might expose sensitive data during storage or transmission.
- **SR-3:** Inadequate authentication and authorization protocols may allow unauthorized users to access.

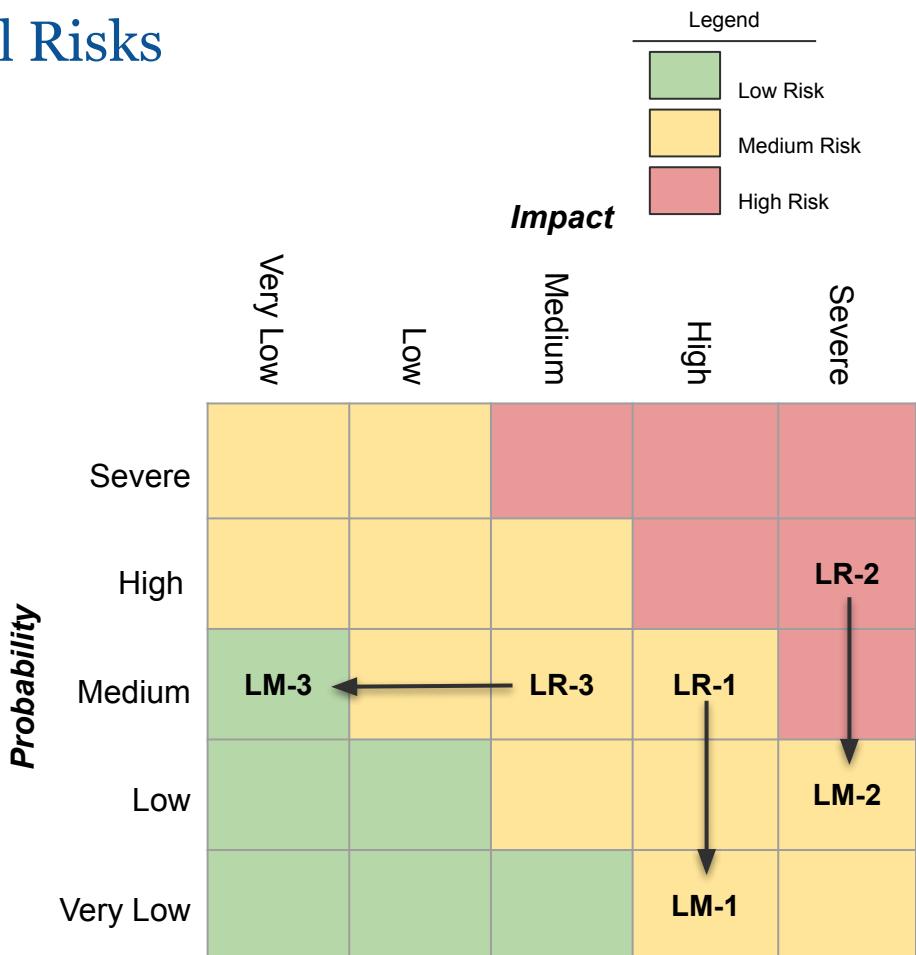
## ❖ Risk Mitigation

- **SM-1:** Implement robust security practices such as data encryption (both at rest and in transit), multi-factor authentication (MFA), and regular security audits.
- **SM-2:** Implement AES-256 encryption, TLS, and RBAC, supported by real-time monitoring and regular audits to thwart breaches.
- **SM-3:** Keep systems updated, conduct ongoing security training, and have a rapid incident response plan to quickly tackle threats.



# Legal Risks

- ❖ Legal Risks
  - **LR-1:** Copyright infringement on competitors
  - **LR-2:** User data privacy violated by data breaches
  - **LR-3:** AI-generated recommendations harming users' financial health
  
- ❖ Risk Mitigation
  - **LM-1:** Extensive research on competitors' features, design, and trademarks to avoid infringement
  - **LM-2:** Implementation of security software and encryption of user data stored in database
  - **LM-3:** Statements shown on account creation page informing users of AI usage and that investment recommendations don't have a 100% guarantee of success



# In Conclusion...

- ❖ CreditTrax provides a comprehensive solution for debt management and budgeting, addressing shortcomings of apps like Mint and YNAB.
- ❖ The innovation of the app combines debt tracking, AI-driven budgeting suggestions, and visual tools to foster healthy financial habits.
- ❖ Despite challenges in data privacy and user retention, its holistic approach enhances financial well-being.
- ❖ CreditTrax empowers users to take decisive action, manage debt effectively, and build a more stable financial future.

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