

(The Fixers)

(Flow Fund AI: Personal Finance Portfolio)

Software Engineering Project

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1.0 INTRODUCTION

1.1 Software Engineers' information

Ayan Lakhani: A full-stack software engineer with experience building end-to-end applications that combine backend logic, databases, and modern frontends. Strong interest in AI-assisted systems and automation, using Python and data-driven approaches to improve workflows and decision-making. Experienced in developing scalable solutions with cloud-ready architectures and real-world constraints in mind.

Vrushti Patel: I have a strong foundation in C/C++, Java, and Python. I am currently working to become a full-stack developer, focusing on building efficient and user-friendly website applications.

Kirtan Patel: I have strong skills in web programming and game development. I have experience building interactive web applications using modern frameworks and developing gameplay systems, while applying problem-solving skills to both software and game design.

Quang Tran: A full-stack SWE with hands-on experience in building and deploying production-ready, cloud-native applications. A strong interest in AI-integrated systems, utilizing Python, and AWS to automate. Experienced from React frontends to Node/Python backends and scalable databases.

Vishal Venu Bangare: A computer science student with strong skills in software engineering, data analysis, and backend development. Experienced in Python, Java, SQL, and full-stack web development, with hands-on work in building scalable applications and data pipelines. Strong interest in AI-assisted systems, analytics, and performance optimization, developed through internships, research, and hackathon projects.

1.2 Planning and Scheduling

Assignee Name	Email address	Task	Duration (hours)	Dependency	Due Date	Evaluation
Ayan Lakhani	alakhani18@student.gsu.edu	Activity Diagram	1 hr	Split with Vishal	2/1/26	
Vrushti Patel	vpatel131@student.gsu.edu	Context Diagram	1 hour	None	2/1/26	
Kirtan Patel	kpatel315@student.gsu.edu	Problem Statements	1 hour	Split with Quang	2/1/26	

Quang Tran	qtran30@student.gsu.edu	Problem Statements	2 hours	Split with Kirtan	2/1/26	
Vishal Venu Bangrae	vbangrael@student.gsu.edu	Activity Diagram	1 hr	Split with Ayan	2/1/26	

1.3 Teamwork Basics

- We will be using Microsoft Teams for communication purposes and meetings.
- Everyone should check the group chat twice a day for any progress or questions.
- We should hold a meeting once a week on weekends if possible.
- Set deadlines and share everyone's progress in the meeting.
- We will divide the project into clear tasks and assign responsibilities based on each member's strengths.
- We will set internal deadlines ahead of the official due dates to allow time for review and revisions.
- We will use a rotating facilitator to keep the project on schedule and ensure meetings stay task-focused.
- We will review each deliverable as a group before submission and agree on quality standards.
- We will document decisions, changes, and progress so nothing gets lost between meetings.
- We will address missed deadlines or incomplete work immediately and redistribute tasks if necessary.
- We will use agreed-upon communication tools to share updates, files, and feedback efficiently.
- We will resolve disagreements by focusing on project requirements and reaching a consensus on the best solution

1.4 Problem Statement

FundFlow AI is a spending-aware investing platform designed to simplify investing for young adults and college students (ages 18-24) by reducing risk, confusion, and financial stress through education, safety, and intelligent automation. Unlike traditional investing or budgeting apps that treat spending and investing separately, FundFlow AI analyzes real spending behavior, income stability, budgeting habits, and risk tolerance to generate an AI-based investment readiness score before making any recommendation, ensuring users only invest when it is financially appropriate. Our platform does not autonomously trade; instead, it provides guided decision support by either recommending historically stable investment options or delivering personalized educational guidance to improve financial literacy and readiness. Targeted primarily at new investors and micro-investment users seeking smarter automation and secondarily at individuals who struggle with budgeting and financial awareness, the product addresses the common fear that investing feels risky and overwhelming without stable income or predictable expenses.

Built with a React/React Native frontend, a Node.js/Express backend, Python-based ML services, and a secure MySQL data layer, the system integrates market data pipelines, an explainable AI readiness engine, and an AI chatbot with guardrails using RAG for transparent, compliant guidance. Strong security and fraud prevention measures, including MFA, role-based access, session security, encryption, audit logs, and anomaly detection, are core technical pillars. FundFlow AI differentiates itself from platforms like Acorns, Robinhood, and YNAB by combining spending awareness, financial readiness evaluation, and explainable investment guidance into one adaptive system, helping users build healthier investing habits early while maintaining confidence, transparency, and long-term financial stability.

List of features:

1. User Management
2. AI Financial Chatbot
3. Dashboard and analysis/ visualizations
4. Transaction Monitoring
5. AI investment readiness score engine
6. Investment simulations
7. Security/Privacy
8. Alerts and Notifications
9. Market Data Evaluation/Integration
10. Investment readiness module
11. Historical analysis
12. Goals/expectations and growth expectation

1.5 System Requirements

1.5.1 Context Diagram

FlowFund AI is a single, centralized system that interacts with other external systems and services required to calculate spending-aware investment analysis. This system is responsible for managing users, storing financial information, performing AI-driven analysis, delivering notifications or alerts, and getting financial data. The connected external systems are the User/Admin management module, Notifications/Alerts, Banking data system, Market data system, OpenAI/LLMs, and Financial data storage.

User/Admin management module will support user authentication, authorization, and role-based access control. It is made to identify users and admin roles, and enforce access restrictions. This will also safely store important users' information.

Banking data system will provide user transaction and account data through third-party financial aggregation services. Now, FlowFund AI will take this data to analyze spending behavior, calculate cash buffer, and support the investment readiness score engine.

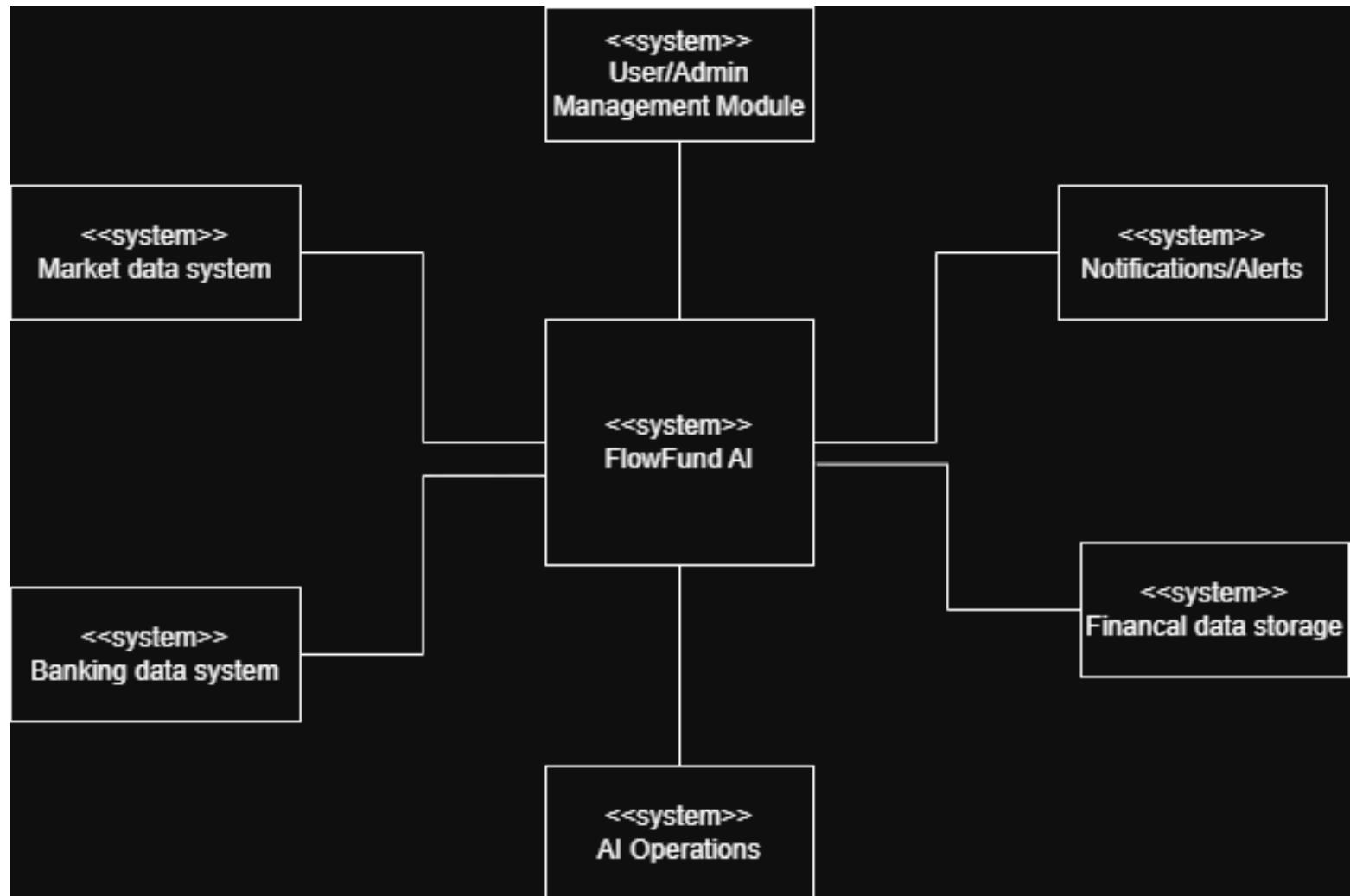
Market Data system will give real-time market information, such as prices and investment trends. In addition to that, FlowFund AI will also use this data for investment simulations, growth projections, and offer explanations without performing real money transactions.

OpenAI/ LLMs will be used to send financial context and analysis results to these models

to generate explanations, recommendations, and responses for the AI financial Chatbot and readiness report.

Notifications and Alerts system delivers system-generated messages to users regarding their readiness score changes, spending spikes, low cash warnings, and goal milestones.

Financial Data System will persist user profiles, transaction records, historical analysis, readiness score changes, and goal data. This storage will help with traceability and long-term analysis.



1.5.2 Activity Diagram

User (Website User)

The user interacts with the FlowFund web application to manage their personal investment journey. The user opens the application, signs up or logs in, sets financial goals and growth targets, completes a risk questionnaire, and links their bank account. Based on the insights provided by the system, the user can view dashboards and analytics, manage a personal watchlist, configure alerts, run optional investment simulations, and interact with the AI financial chatbot. The user also receives notifications and alerts related to spending behavior, readiness score changes, and market conditions.

FlowFund System

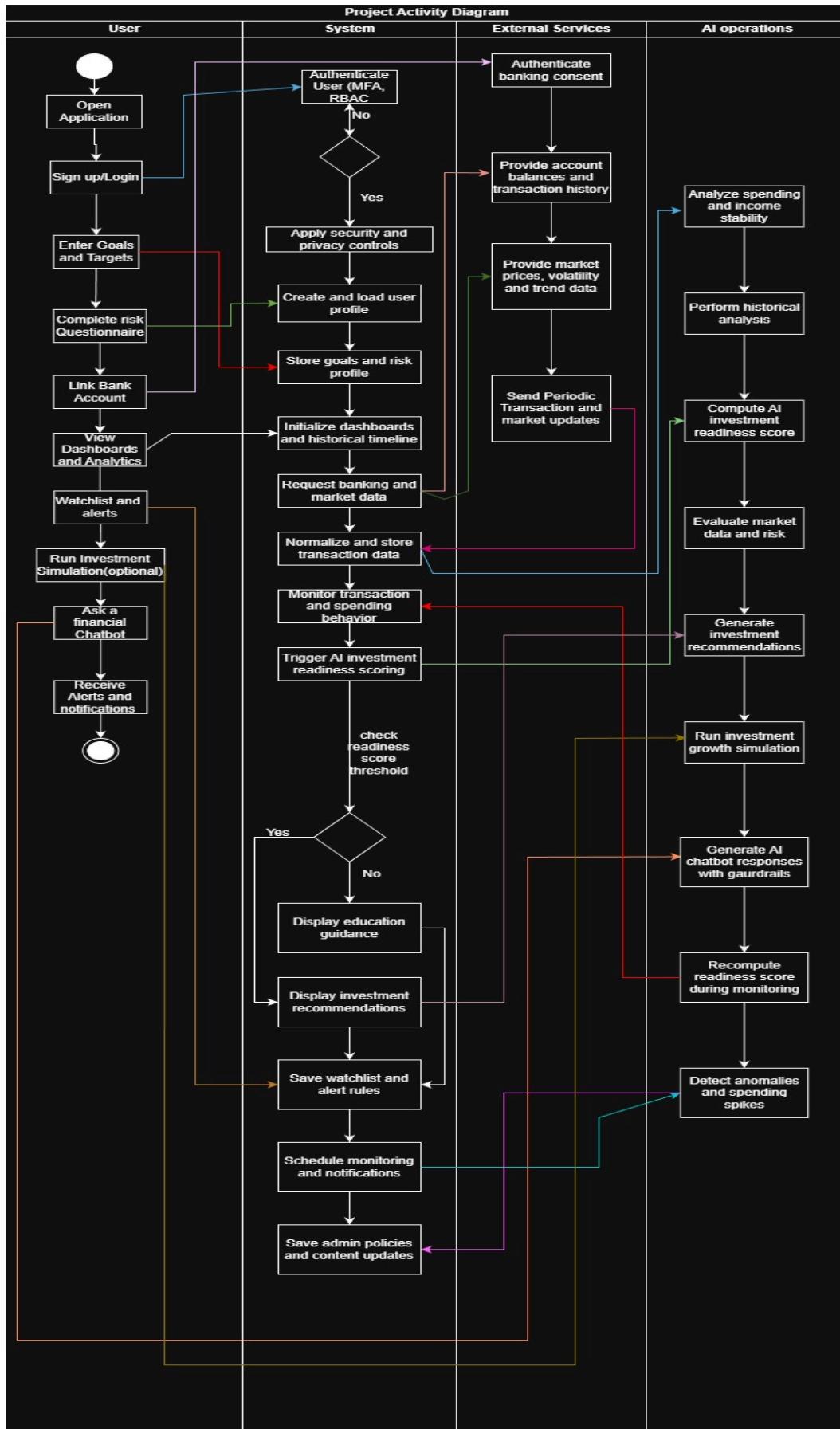
The FlowFund system serves as the core platform that coordinates all application functionality. It handles user authentication using MFA and role-based access control, enforces security and privacy controls, and manages user sessions. The system stores goals, risk profiles, and transaction data, initializes dashboards and historical timelines, and monitors transactions and spending behavior. It triggers AI investment readiness scoring, evaluates readiness thresholds, displays either educational guidance or investment recommendations, saves watchlists and alert rules, and schedules continuous monitoring and notifications. The system also persists administrative policy and content updates to ensure consistent platform behavior.

External Services (Banking and Market Data Providers)

External services supply critical financial data required for analysis and decision-making. Banking services authenticate user consent and provide account balances and transaction history, while market data services deliver asset prices, volatility metrics, and trend information. These services also send periodic transaction and market updates that enable continuous monitoring, alert evaluation, and up-to-date financial insights within the FlowFund platform.

AI Operations

AI operations are responsible for advanced analysis and intelligence within the system. These services analyze spending behavior and income stability, perform historical financial analysis, and compute the AI-based investment readiness score. They evaluate market data and risk factors, generate personalized investment recommendations, and run investment growth simulations based on user goals and risk tolerance. The AI services also generate chatbot responses with built-in guardrails, recompute readiness scores during ongoing monitoring, and detect anomalies or spending spikes that may trigger alerts or system actions.



References

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