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COMP 246 Team 1

PERSONAL FINANCE APPLICATION.

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Part A: Project Scope and Requirements

Section 1: Problem Statement

1.1.a. Problem & Need

The problem at hand is the difficulty for some people in effectively tracking monthly expenses, managing subscriptions across various platforms, monitoring credit card expenses, budgeting effectively, encountering unexpected higher expenses, poor management of bills (such as hydro, internet, gas, etc.), and keeping track of debts and multiple sources of income.

To address these issues, a comprehensive personal finance management application can be developed. This application would provide users with an intuitive interface to track all their monthly expenses in one place, enabling them to monitor and categorize their spending habits effectively. Additionally, the application would integrate with various platforms to automatically track and manage subscriptions, ensuring users are aware of all recurring charges.

The credit card expenses can be managed within the application by linking the user's credit card accounts and providing real-time updates on transactions, balances, and due dates. Users can set budget limits for different expense categories and receive alerts when their spending exceeds the predefined limits. This feature would assist in better budgeting and preventing unexpected expenses.

1.1.b. List of Capabilities and Benefits

(i) Capabilities

- Expense Tracking: The app allows users to easily track and categorize all their monthly expenses, providing a clear overview of where their money is being spent.
- Subscription Management: Users can manage their subscriptions from various platforms within the app, ensuring they are aware of all recurring charges and can cancel or modify subscriptions as needed.
- Credit Card Expense Management: The app integrates with credit card accounts, enabling users to track transactions, balances, and due dates in real-time. This helps users stay on top of their credit card expenses and avoid unnecessary interest charges.
- Budgeting Tools: The application offers budgeting features that allow users to set budget limits for different expense categories. Users can track their spending against these budgets and receive alerts when they exceed predefined limits, helping them maintain financial discipline.
- Bill Management: Users can input their utility bills (such as hydro, internet, gas, etc.) into the app and receive reminders and notifications about due dates. This helps avoid overdue payments and potential penalties.
- Debt Tracking: The app provides a comprehensive debt tracking feature, allowing users to input their outstanding loans, credit card debts, or other financial obligations. Users can monitor their

total debts, interest rates, and repayment progress, and receive suggestions and strategies to efficiently manage and pay off debts.

- Multiple Income Tracking: Users can track and manage multiple sources of income within the app. This includes salary, freelance earnings, investment dividends, or any other income streams, providing a holistic view of their financial situation.
- Expert Financial Advice: The app offers access to expert financial advice, providing users with valuable insights and recommendations from professionals in the field. Users can seek personalized guidance on various financial matters, including budgeting, investment strategies, debt management, and long-term financial planning.

(ii) Benefits

- Enhanced Financial Awareness: The app helps users gain a better understanding of their financial habits by providing a centralized platform to track and analyze their expenses, subscriptions, and income. This leads to improved financial awareness and informed decision-making.
- Improved Budgeting: With budgeting tools and alerts for overspending, users can better manage their finances and ensure they stay within their set budget limits. This promotes responsible spending and helps achieve financial goals.
- Timely Bill Payments: The app's bill management feature ensures that users never miss a payment deadline, helping them avoid late fees, penalties, and negative impacts on credit scores.
- Efficient Debt Management: By tracking and monitoring debts, the app assists users in managing their financial obligations effectively. Users can make informed decisions on debt repayment strategies, reduce interest costs, and work towards becoming debt-free.
- Streamlined Subscription Management: The app simplifies subscription management by providing an overview of all recurring charges. Users can easily identify and cancel unnecessary subscriptions, saving money in the process.
- Comprehensive Financial Overview: With all financial data consolidated in one place, users can gain a comprehensive view of their overall financial health. This allows for better financial planning, identifying areas for improvement, and making informed financial decisions.
- Time and Effort Savings: The app automates the process of expense tracking, bill management, and income tracking, saving users time and effort that would otherwise be spent on manual calculations and record-keeping.
- Enhanced Financial Decision-Making: By incorporating expert financial advice, the app empowers users to make well-informed decisions about their financial goals and strategies. Users can receive personalized recommendations tailored to their specific circumstances, helping them optimize their financial choices and maximize their financial outcomes. This feature ensures that users have access to professional expertise and guidance, even if they do not have direct access to a financial advisor, leading to improved financial decision-making and potential wealth growth.

1.2 Identify the stakeholders and their roles.

- Clients: These are the individuals who use the app to manage their personal finances and benefit from its features and capabilities.
- Financial Institutions: These entities play a crucial role in ensuring regulatory compliance and can also facilitate the integration of the app with users' bank accounts. By linking the app to bank accounts, users can access real-time financial data, such as transaction history, balances, and statements, directly within the app. This integration can enhance the accuracy and efficiency of economic management, enabling users to have a comprehensive view of their finances and enabling seamless synchronization of financial information.
- Developers: They are responsible for the maintenance and technical aspects of the app, including its functionality, performance, and security. They work on improving the app's features, fixing bugs, and ensuring a smooth user experience.
- Financial Professionals*: These experts provide financial advice within the app, leveraging their knowledge and experience to guide users in making sound financial decisions. They may offer personalized recommendations, answer user queries, and provide insights into various financial matters.
- Owners/Admins/Managers: These individuals or entities take overall responsibility for the app. They may be the app's creators, managers, or owners, ensuring its smooth operation, overseeing its development, and making strategic decisions to enhance its functionality and user experience.

*Note: In the context of the app, financial professionals could refer to certified financial planners, financial advisors, accountants, or other professionals with expertise in finance and personal economic management.

1.3 Identify the sub-systems of your application (What are its functional components)

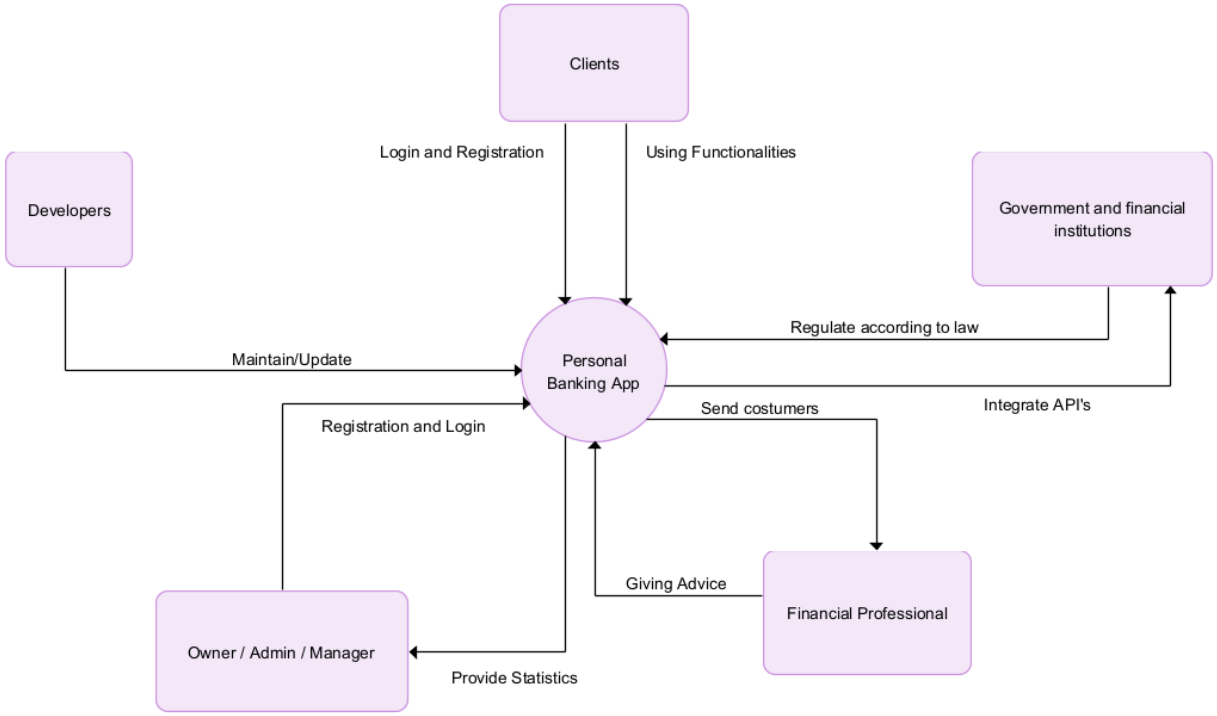
- User Login and Registration: This subsystem handles the login and registration process, ensuring secure access for users.
- Subscription Management: The app includes a subsystem to manage subscriptions, allowing users to track and manage recurring costs associated with the app or other services.
- Budget Planning: Users can set spending limits or budgets for their income, enabling them to plan and manage their finances effectively.
- Tracking and Alert: This subsystem encompasses expense tracking, income tracking, debt tracking, credit tracking, and savings tracking. Users can monitor their expenses, track their income, keep an eye on their debts, set credit limits, track credit transactions, and monitor their savings. Also, the system is going to create monthly alerts regarding each transaction.
- Progress Monitoring: Users can compare their current financial situation with previous months or years, enabling them to check their progress and make informed decisions based on trends.
- Financial Advising: The app offers financial advice tailored to users' specific needs and circumstances, providing guidance on managing their finances and making informed decisions with the help of experts and financial professionals.

1.4 Who are the intended users of the SRS documentation.

- Developers
- Administrators/Owners/Managers

Section 2: General Overview Modelling

2.1 Context Flow Diagram (CFD)



Section 3: Requirements - functional and non-functional

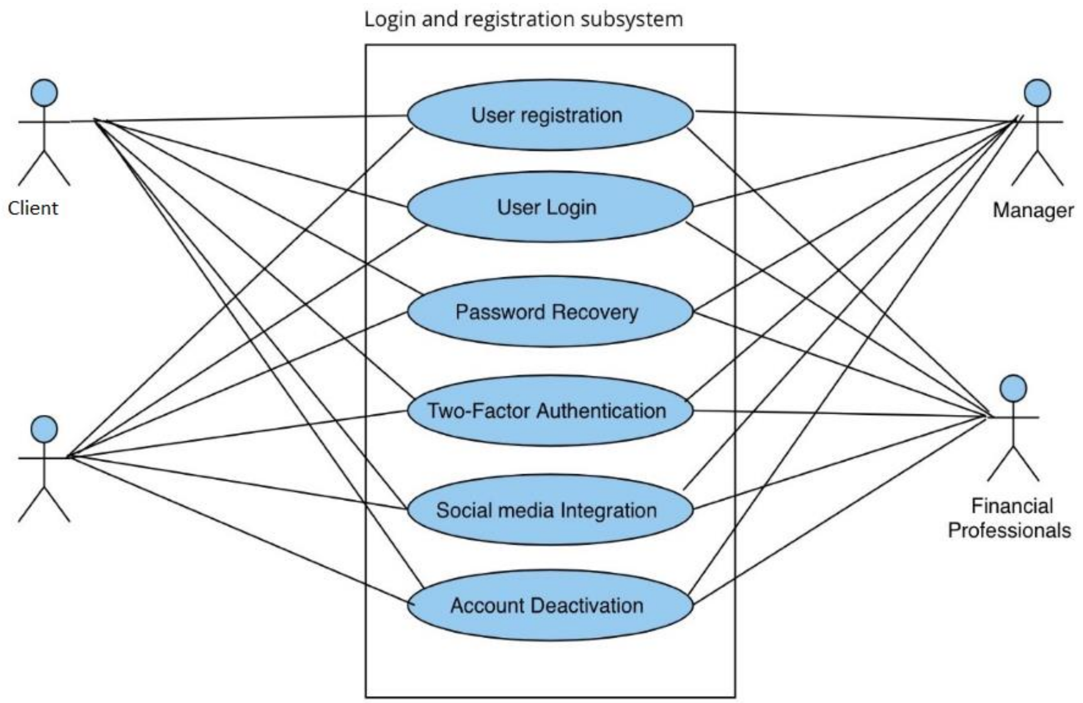
3.1 Non- functional Requirements

NFR#	Name	Description
NFR001	Security	The app should implement robust security measures to protect user data, including encryption, secure authentication, and protection against breaches.
NFR002	Performance	The app should perform efficiently and respond quickly to user actions, ensuring minimal latency and smooth user experience.
NFR003	Scalability	The app should be able to handle increasing user load and data volume without compromising performance, ensuring scalability as the user base grows.
NFR004	Reliability	The app should be reliable and available for users, minimizing downtime and system failures to ensure uninterrupted access to financial information.
NFR005	Usability	The app should have a user-friendly and intuitive interface, making it easy for users to navigate, understand, and perform financial tasks efficiently.
NFR006	Accessibility	The app should comply with accessibility standards, ensuring that users with disabilities can access and use the app effectively.
NFR007	Compatibility	The app should be compatible with various devices, operating systems, and web browsers, ensuring broad accessibility for users.
NFR008	Data Backup and Recovery	The app should regularly back up user data and provide mechanisms for data recovery in case of system failures or data loss.
NFR009	Privacy and Data Protection	The app should adhere to privacy regulations, protecting user data and providing clear information on data handling and consent.
NFR010	Internationalization and Localization	The app should support multiple languages, currencies, and date/time formats, allowing users from different regions to use the app effectively.
NFR011	Performance Monitoring and Analytics	The app should have monitoring capabilities to track performance metrics, identify bottlenecks, and gather insights for optimization and improvements.
NFR012	Documentation and Support	The app should provide comprehensive documentation and user support to assist users in using the app's features and resolving issues effectively.

3.2 Functional Requirements

3.2.1 Login and Registration Subsystems

FR#	Name of the Use Case	Role Player	Description
FR001	User Registration	Clients, Admin/Manager	Allows users of the app to create an account by providing necessary information like username, password, and email. Admin/Manager oversees the registration process.
FR002	User Login	Clients	Enables users to log into the app using their registered credentials to access their financial information.
FR003	Password Recovery	Clients	Allows users to recover their account password by following a password reset process, typically involving email verification or security questions.
FR004	Two-Factor Authentication	Clients	Provides an additional layer of security by implementing two-factor authentication, requiring users to verify their identity through a second authentication method, such as a verification code sent to their mobile device.
FR005	Social Media Integration	Clients	Allows users to register or log into the app using their social media accounts, such as Facebook or Google, providing a convenient and streamlined login experience.
FR006	Account Deactivation	Clients, Admin/Manager	Allows users to deactivate or suspend their account temporarily, disabling access to the app and financial information. Admin/Manager handles account deactivation requests and reactivation processes.



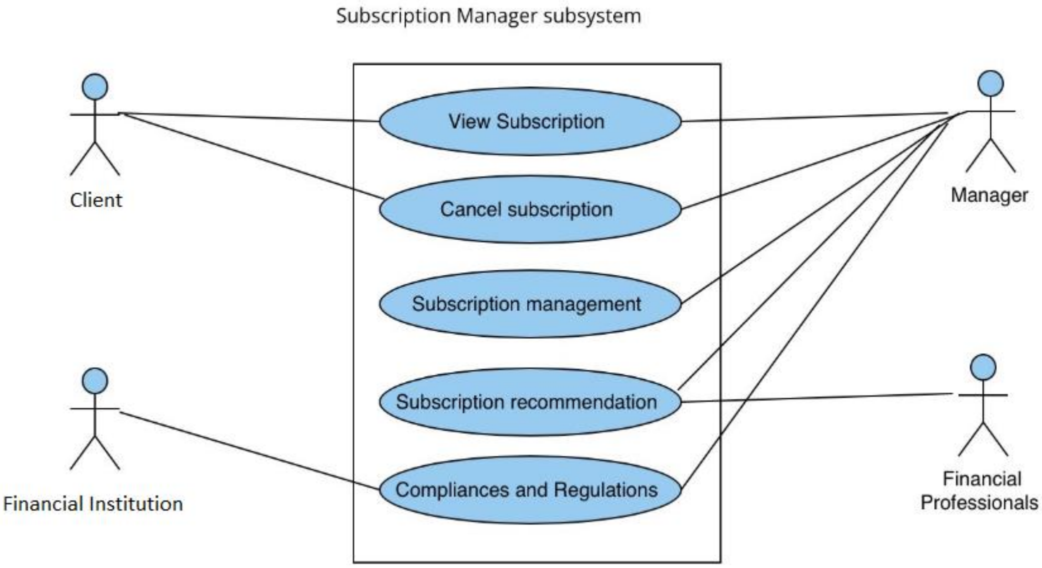
User Story

1. As a user, I need to register for an account in the app to access my financial information.
2. As a user, I need to log into the app using my registered credentials to view and manage my financial data.
3. As a user, I need to recover my account password in case I forget it or need to reset it.
4. As a user, I want the option to register or log into the app using my social media accounts for a convenient login experience.
5. As a user, I need to deactivate or suspend my account temporarily when necessary and reactivate it later if needed.

3.2.2 Subscription Manager Subsystem

FR#	Name of the Use Case	Role Player	Description
FR007	View Subscriptions	Clients	Clients
FR008	Cancel Subscription	Clients, Admin/Manager	Allows clients to cancel their app subscription, terminating future billing and access to premium features. Admin/Manager manages the cancellation process.
FR009	Subscription Management	Admin/Manager	Manage app subscriptions, including handling client requests for plan changes, cancellations, and account reactivations.
FR010	Subscription Recommendations	Financial Professional	Provide recommendations or guidance to clients regarding their app subscription plans,

			helping them choose the most suitable option based on their financial needs and goals.
FR011	Compliance and Regulations	Financial Institution	Ensure that the app's subscription management system adheres to the relevant regulations and standards.



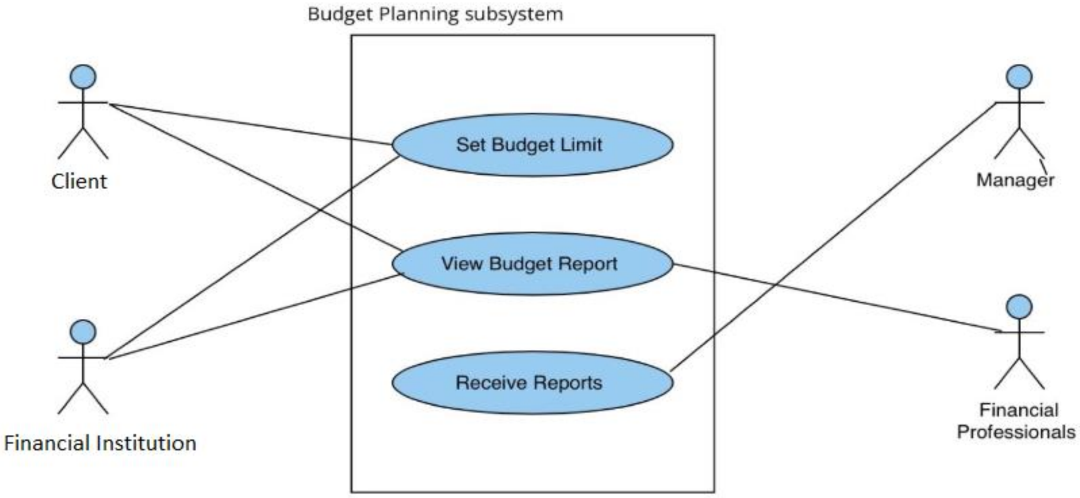
User Story

1. As a client, I need to view my current app subscriptions and associated details, such as plan type and renewal date.
2. As a client, I need the ability to cancel my app subscription when required, ensuring that future billing is stopped, and access to premium features is terminated.
3. As an admin/manager, I need to manage app subscriptions, including handling client requests for plan changes, cancellations, and account reactivations.
4. As a financial professional, I may provide recommendations or guidance to clients regarding their app subscription plans, helping them choose the most suitable option based on their financial needs and goals.
5. As a government/financial institution, I need to ensure that the app's subscription management system adheres to the relevant regulations and standards.

3.2.3 Budget Planning Subsystem

FR#	Name of the Use Case	Role Player	Description

FR012	Set Budget Limits	Clients	Enables clients to set limits on their income to control and track their spending within specified budget categories.
FR013	View Budget Reports	Clients, Financial Advisors	Allows users to view reports that compare actual spending with budgeted amounts for distinct categories, providing insights into their economic management. Financial professionals can provide advice and guidance on budgeting strategies.
FR014	Receive Reports	Admin/Manager	Allows the Admin of the app to receive reports or data related to client's budget planning activities for analysis and performance evaluation of the app's budgeting features.



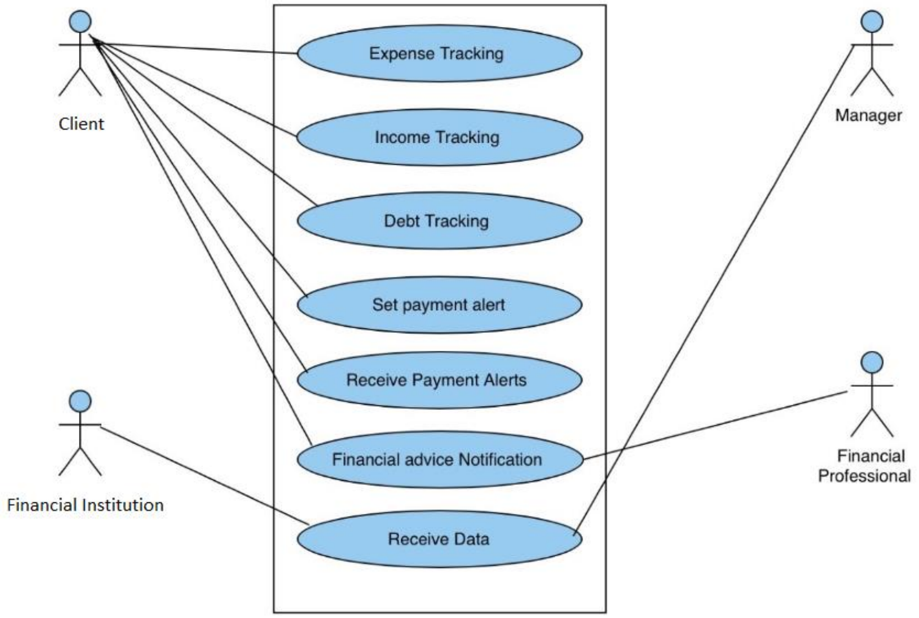
User Story

1. As a client, I want to set budget limits to control and track my spending within specified categories and ensure I stay within my financial goals.
2. As a client, I need to view budget reports that compare my actual spending with the budgeted amounts for distinct categories, providing insights into my economic management.
3. As a client, I may seek advice from financial professionals who can guide me in creating an effective budgeting strategy.
4. As a financial professional, I may offer advice or assistance to clients in setting budget limits and creating effective budgeting strategies tailored to their financial goals.
5. As an admin/manager, I may receive reports or data related to clients' budget planning activities for analysis and performance evaluation of the app's budgeting features.

3.2.4 Tracking and Alert Subsystem

FR#	Name of the Use Case	Role Player	Description
FR015	Expense Tracking	Clients	Allows clients to track their expenses, categorize them, and view detailed reports on how much they have spent in various categories.
FR016	Income Tracking	Clients	Enables clients to track their incomes from various sources and view reports on their total income over a specified period.
FR017	Debt Tracking	Clients	Allows clients to track their debts, including loans or credit card balances, and view reminders about upcoming payment due dates.
FR018	Set Payment Alerts	Clients	Allows clients to set alerts for due payments, such as bill payments or credit card payments, to receive notifications before the due date.
FR019	Receive Payment Alerts	Clients	Notifies clients about upcoming payment due dates and provides reminders to ensure timely payment.
FR020	Financial Advice Notifications	Clients, Financial Advisors	Sends notifications to clients with relevant financial advice, tips, or educational content to help them improve their financial knowledge and decision-making.
FR021	Receive data	Financial institution	Track data to verify compliance with financial regulations and detect any suspicious or fraudulent activities.

Tracking and Alerts subsystem

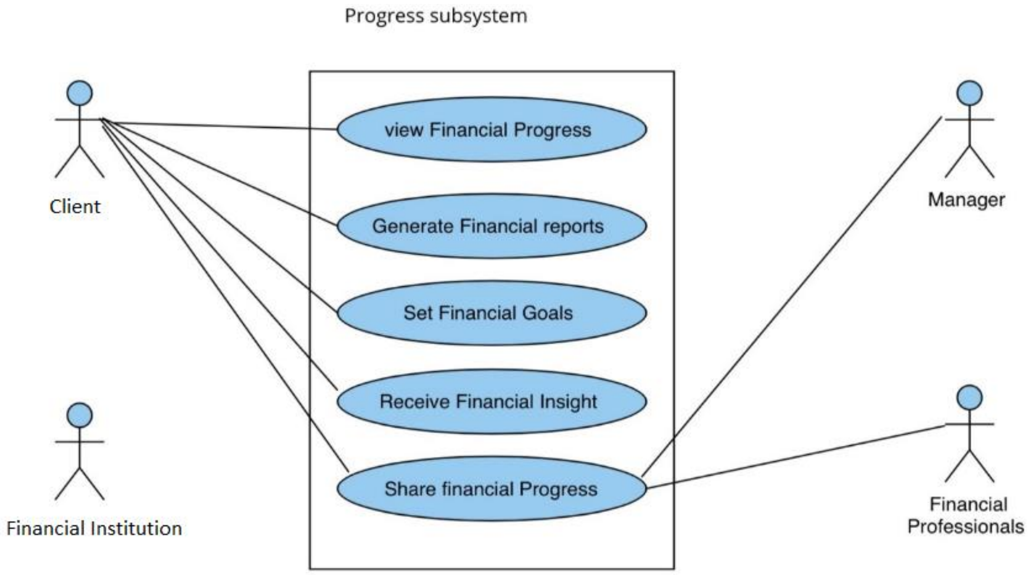


User Story

1. As a client, I need to track my expenses, categorize them, and view detailed reports to understand where my money is being spent.
2. As a client, I want to track my income from various sources and view reports that show my total income over a specified period.
3. As a client, I need to track my debts, including loans or credit card balances, and receive reminders about upcoming payment due dates.
4. As a u client ser, I need to set payment alerts to receive notifications before the due dates of my bills or credit card payments.
5. As a client, I need to receive payment alerts to be reminded about upcoming payment due dates and avoid overdue payments.
6. As a client, I expect the app to check and ensure that I comply with the rules and regulations set by financial institutions and the government.
7. As a client, I want to receive financial alerts about major events such as bill due dates, account balances, or budget thresholds.
8. As a financial professional, I may analyze clients' expense and income tracking data to provide personalized recommendations and insights for improved economic management.
9. As an admin/manager, I may monitor the performance and accuracy of the tracking subsystem, ensuring that it meets the app's standards and user expectations.
10. As a government/financial institution, I may review clients' tracking data to verify compliance with financial regulations and detect any suspicious or fraudulent activities.

3.2.5 Progress Subsystem

FR#	Name of the Use Case	Role Player	Description
FR022	View Financial Progress	Clients	Enables clients to compare their current financial situation with previous months or years to track progress and identify trends.
FR023	Generate Financial Reports	Clients	Allows clients to generate comprehensive financial reports, including income statements, expense reports, net worth statements, and budget analysis.
FR024	Set Financial Goals	Clients	Enables clients to set financial goals, such as saving targets or debt reduction goals, and track their progress towards achieving those goals.
FR025	Receive Financial Insights	Clients, Financial Professionals	Provides clients with personalized financial insights and recommendations based on their financial data, helping them make informed decisions and improve their financial well-being.
FR026	Share Financial Progress	Clients, Financial Professionals	Allows clients to share their financial progress and reports with financial professionals or advisors for further analysis and guidance.



User Story

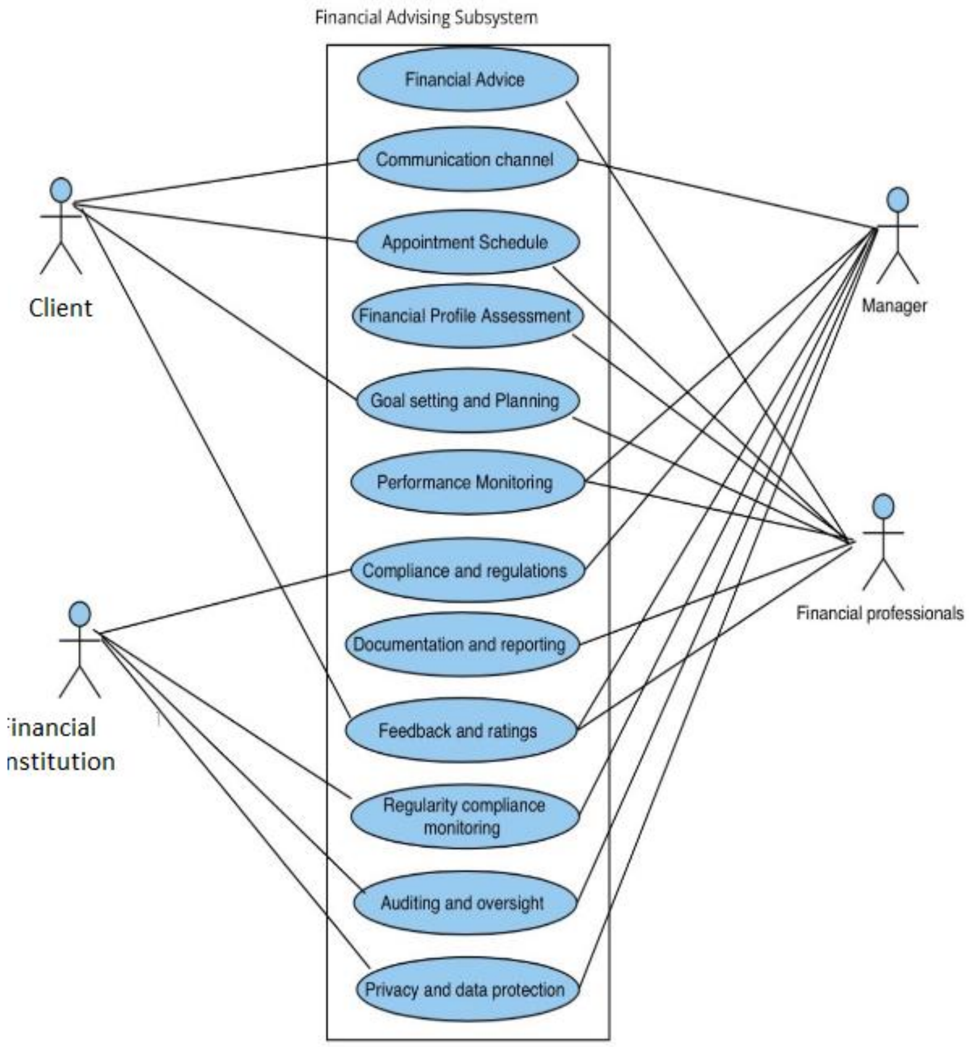
1. As a client, I want to compare my current financial situation with previous months or years to track my progress and identify trends.
2. As a client, I need to generate financial reports that provide a comprehensive overview of my financial status, including income statements, expense reports, net worth statements, and budget analysis.
3. As a client, I want to set financial goals, track my progress towards achieving them, and receive insights and recommendations from financial professionals.
4. As a client, I may share my financial progress and reports with financial professionals or advisors to seek further analysis and guidance.
5. As a financial professional, I may review users' financial progress reports to provide guidance, suggestions, and strategies to help them achieve their financial goals.
6. As an admin/manager, I may analyze users' progress data to evaluate the effectiveness of the app's features and identify areas for improvement or additional functionalities.

3.2.6 Financial Advising Subsystem

FR#	Name	Role	Requirement
FR027	Financial Advice	Financial Professional	Provide personalized financial advice to clients, considering their financial goals, income, expenses, and other relevant factors.
FR028	Communication Channel	Client, Manager	Facilitate communication between clients and financial professionals, allowing them to exchange messages, queries, and information related to financial advice.

FR029	Appointment Scheduling	Client, Financial Professional	Enable clients to schedule appointments with financial professionals for in-depth consultations or discussions regarding their financial matters.
FR030	Financial Profile Assessment	Financial Professional	Conduct a comprehensive assessment of a client's financial profile, including income, expenses, assets, liabilities, risk tolerance, and investment preferences, to offer more accurate and tailored financial advice.
FR031	Goal Setting and Planning	Client, Financial Professional	Assist clients in setting financial goals and developing personalized financial plans to achieve those goals, considering factors such as budgeting, saving, investing, debt management, and other relevant aspects.
FR032	Performance Monitoring	Financial Professional, Manager	Monitor the financial progress of clients, track their investment performance, and provide periodic updates and insights to help clients stay on track towards their financial goals.
FR033	Compliance and Regulations	Government/Financial Institution, Manager	Ensure that the financial advising feature of the app complies with relevant financial regulations, ethics, and industry standards, protecting client's interests and maintaining the integrity of the financial advice provided.
FR034	Documentation and Reporting	Financial Professional	Generate comprehensive reports and documentation summarizing the financial advice provided, financial plans, investment recommendations, and any other relevant information, to serve as a reference for both the clients and financial professionals.
FR035	Feedback and Ratings	Client, Financial Professional, Manager	Allow clients to provide feedback and ratings for the financial professionals they interact with, helping to improve the quality of financial advice and enhancing user satisfaction.
FR036	Regulatory Compliance Monitoring	Government/Financial Institution, Manager	Monitor and ensure that the financial advising feature of the app complies with applicable regulatory requirements, financial standards, and guidelines set by the government and financial institutions.
FR037	Auditing and Oversight	Government/Financial Institution, Manager	Conduct periodic audits and oversight of the financial advising system to assess its adherence to regulatory and compliance standards, ensuring the quality and legality of financial advice provided to users.
FR038	Privacy and Data Protection	Government/Financial Institution, Manager	Ensure that client data and privacy are adequately protected within the financial

			advising subsystem, complying with relevant data protection laws and regulations to safeguard sensitive financial information.


Financial Advising Subsystem
Financial Advice
Communication channel
Appointment Schedule
Financial Profile Assessment
Goal setting and Planning
Performance Monitoring
Compliance and regulations
Documentation and reporting
Feedback and ratings
Regularity compliance monitoring
Auditing and oversight
Privacy and data protection
Client
inancial
nstitution
Manager
Financial professionals

User Story

1. As a client, I need to receive personalized financial advice to make informed decisions about my financial matters.
2. As a client, I want to communicate with financial professionals through the app, asking questions and seeking clarification regarding financial advice.
3. As a client, I would like to schedule appointments with financial professionals for detailed discussions and consultations on my financial goals and plans.

4. As a financial professional, I need to assess a client's financial profile to gain a comprehensive understanding of their financial situation and provide appropriate advice.
5. As a financial professional, I should assist users in setting financial goals and developing personalized financial plans aligned with their aspirations and circumstances.
6. As a financial professional, I must monitor clients' financial progress, review investment performance, and offer updates and insights to help them stay on track.
7. As a government/financial institution, I must ensure that the financial advising feature of the app complies with relevant regulations, ethical standards, and industry guidelines.
8. As a government/financial institution, I should oversee the documentation and reporting processes to ensure accurate and transparent financial advice for clients.
9. As a government/financial institution, I need to monitor user feedback and ratings to maintain the quality and credibility of financial advice provided by professionals.

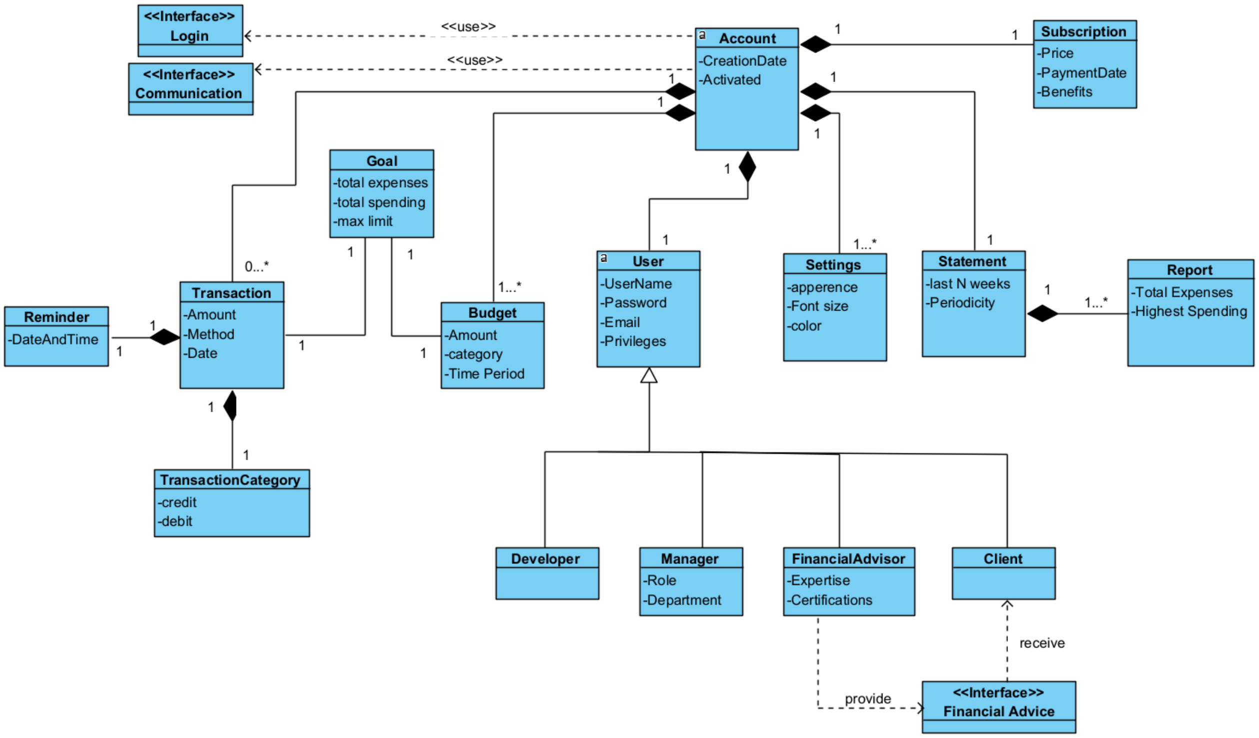
Section 4: Domain Class Diagram

4.1 List of classes

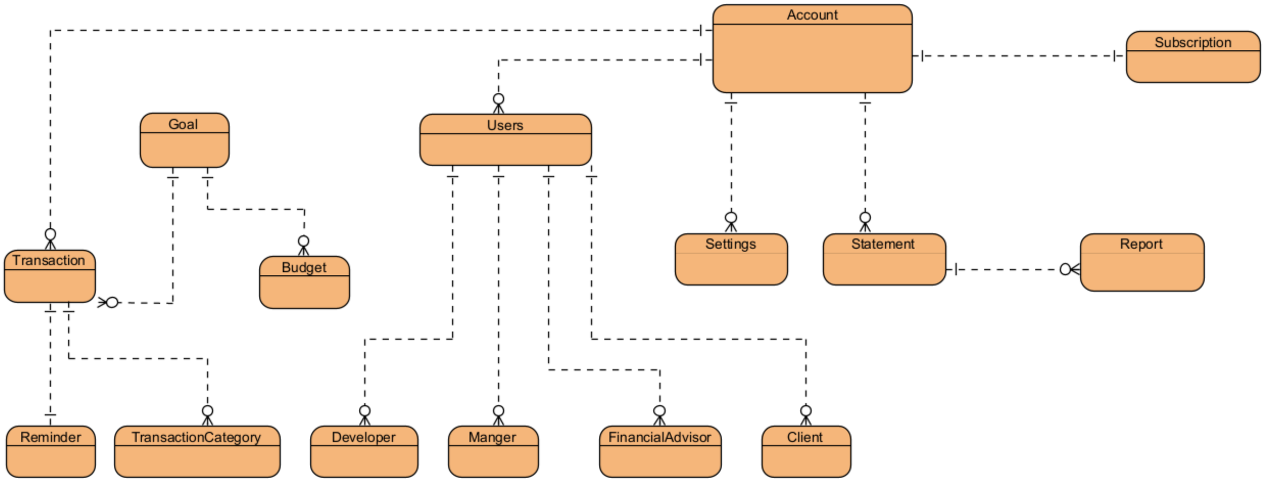
- User
- Account
- Transaction
- TransactionCategory
- Budget
- Report
- Reminder
- Goal
- Settings
- Statement
- Client
- Developer
- Manager
- FinancialAdvisor

- Subscription

4.2 Diagram

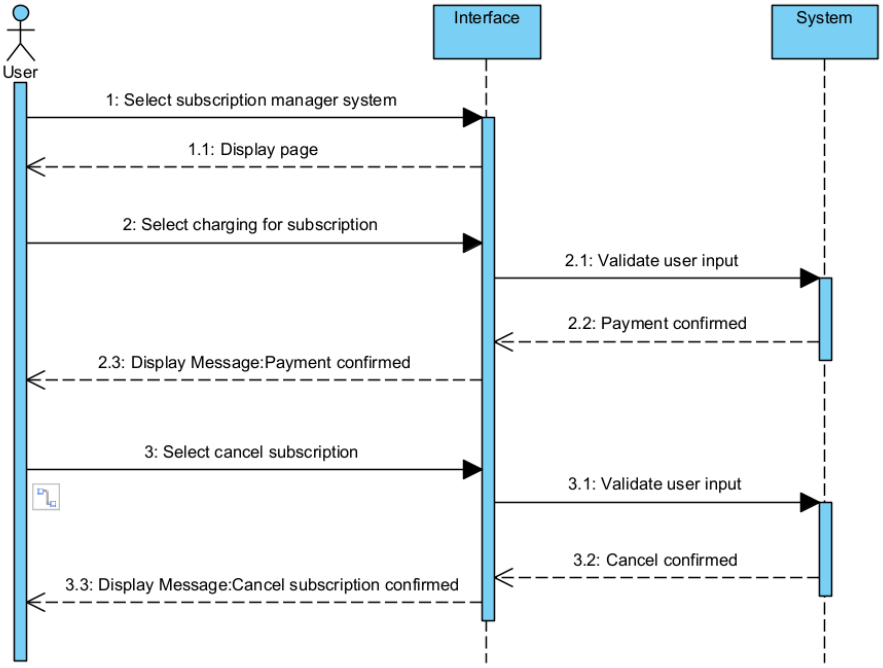


Section 5: ERD

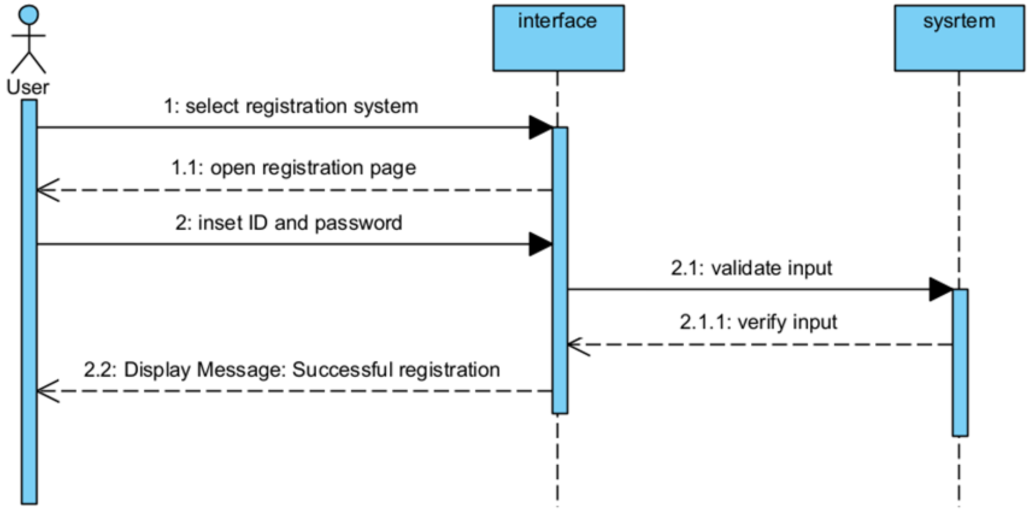


Section 6: System Sequence Diagrams

6.1 Subscription Manager (Use Case: Subscribe to the App)

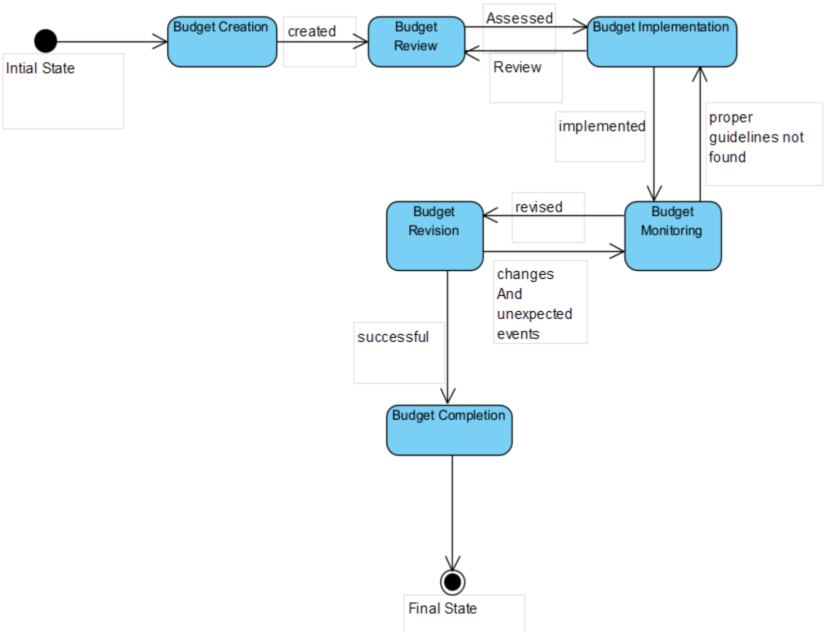

User
Interface
System
1: Select subscription manager system
1.1: Display page
2: Select charging for subscription
2.1: Validate user input
2.2: Payment confirmed
2.3: Display Message:Payment confirmed
3: Select cancel subscription
3.1: Validate user input
3.2: Cancel confirmed
3.3: Display Message:Cancel subscription confirmed

6.2 Login and Registration (use case: Register into the system)

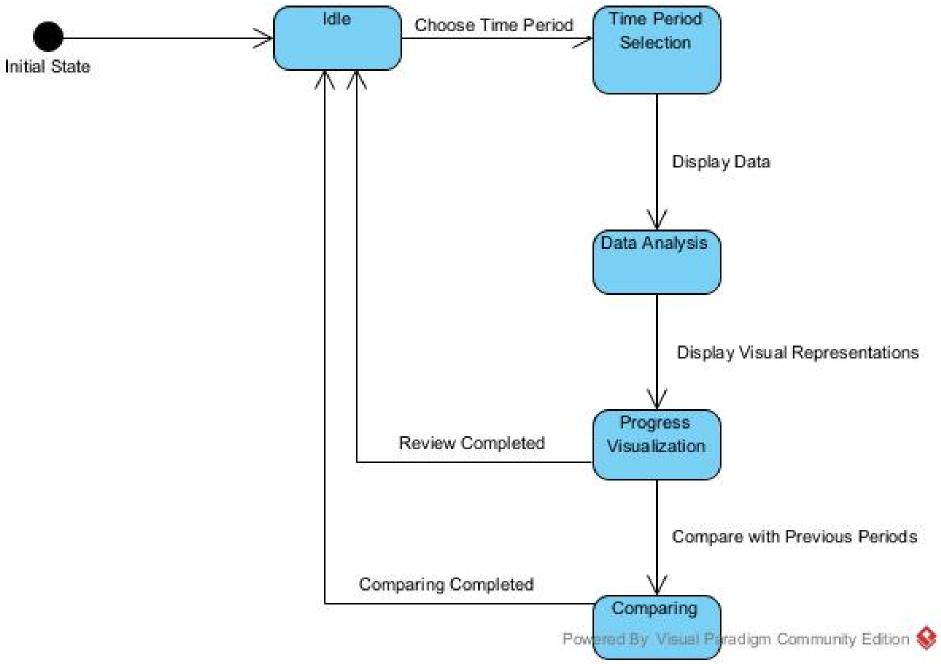

User
interface
sysrtem
1: select registration system
1.1: open registration page
2: inset ID and password
2.1: validate input
2.1.1: verify input
2.2: Display Message: Successful registration

Section 7: State Diagrams

7.1 Budget Planning



7.2 Progress Monitoring



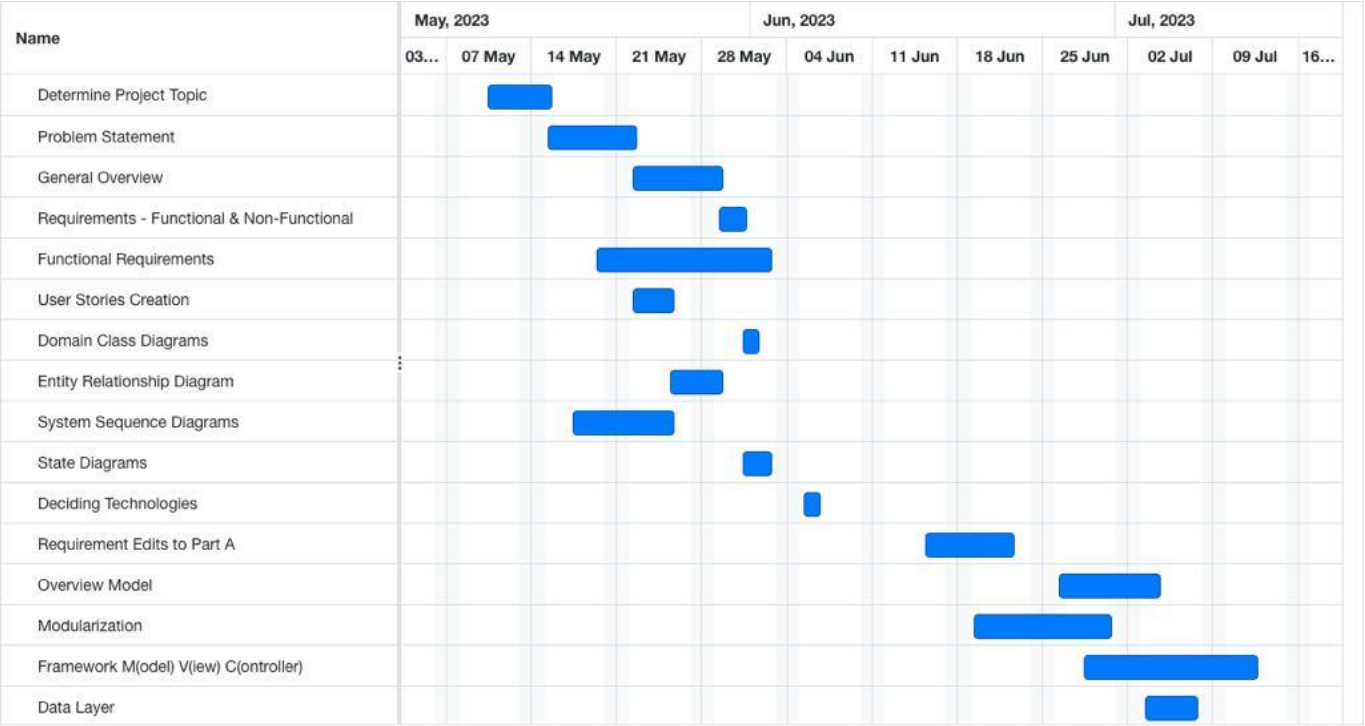
Section 8: Technologies

8.1 Web Application: HTML, CSS, JavaScript, C#, ASP.NET MVC Core

8.2 Mobile App: React Native, Flutter, Xamarin, Ionic, PhoneGap/Cordova

8.3 Database: Oracle SQL

Section 9: Project Management (Gantt Chart)



Part B: Software Design Architecture

Section 1: Requirements Edits to Part A

1.1 Corrections on the stakeholder's section (Section 1.2)

- “Users” was changed to “Clients” and “Government and financial institutions” was changed to “Financial Institutions”

1.2 Identify the sub-systems of the application (Section 1.3)

- User Login and Registration: This subsystem handles the login and registration process, ensuring secure access for users.

1.3 Corrections on the use cases section (Section 3.2)

- Changes were made on both use cases diagram and explanations due to change on the stakeholders

1.4 Corrections on the System Sequence Diagrams (Section 6)

- Subscription Manager: Title of the diagram is updated to Subscription Manager (Use Case: Subscribe to the App)
- Login and Registration: Login and Registration (use case: Register into the system)

1.5 Corrections on the Project Management (Section 9)

- Gantt Chart dates updated according to the project scope

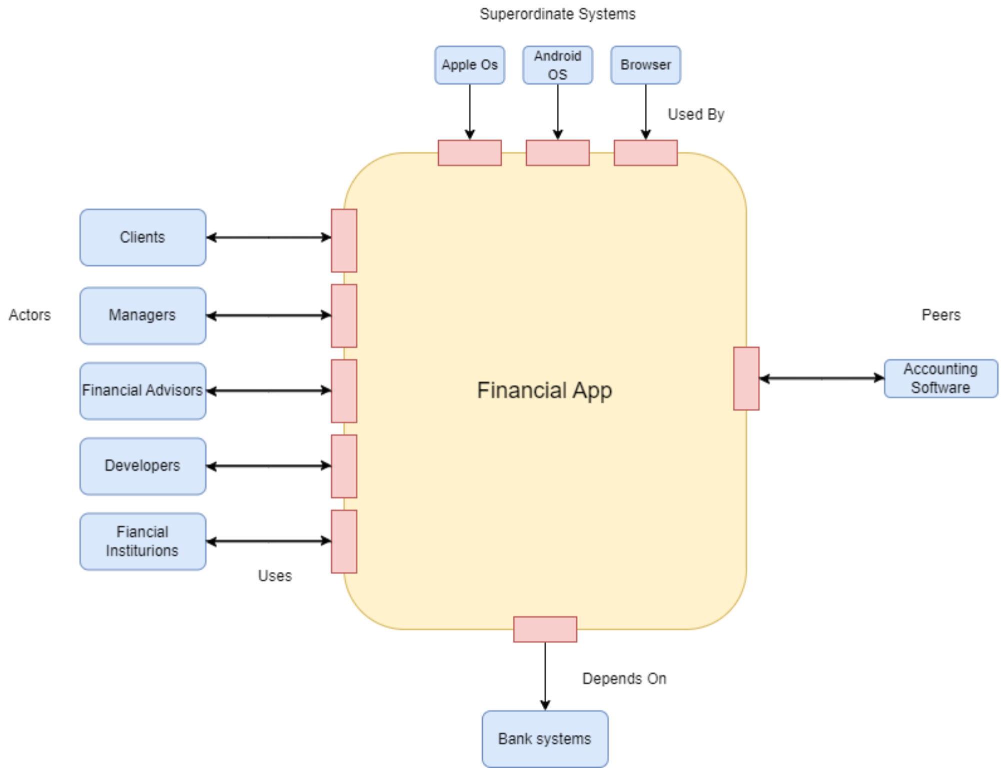
Section 2: Overview Model

2.1 Intended users of the SDD document

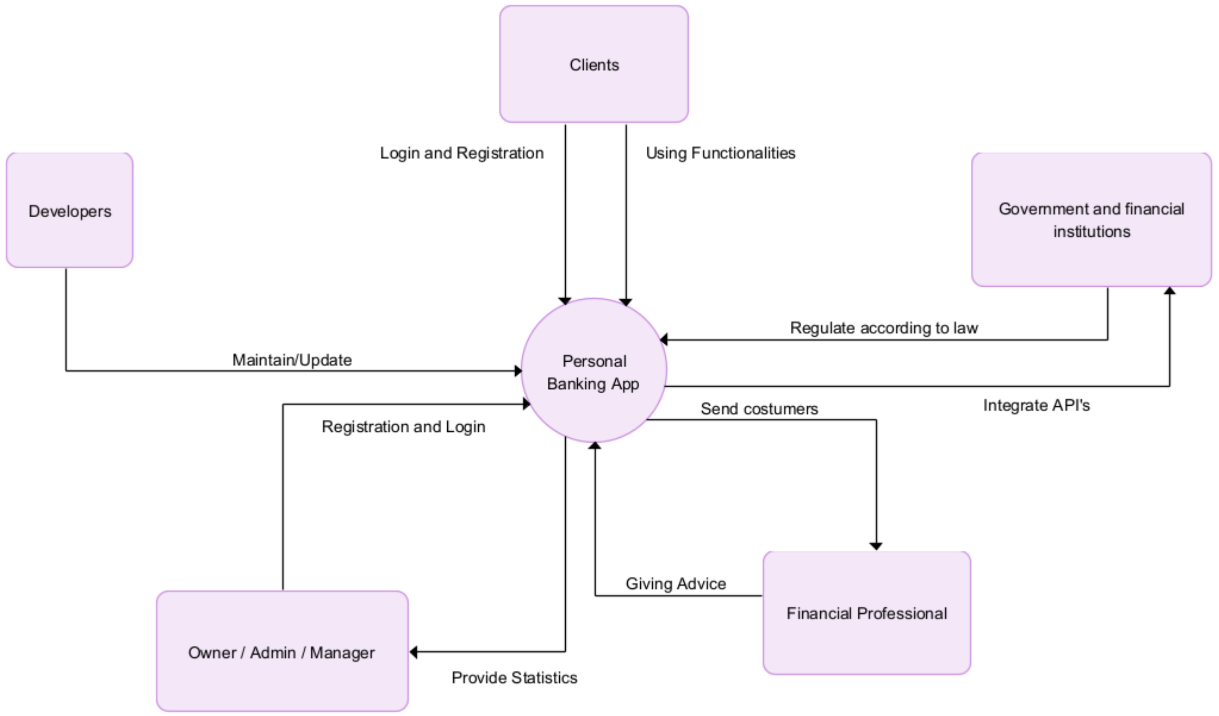
The main objective of the System Design Document (SDD) is to offer a comprehensive overview of the system's design, enabling software developers to acquire a thorough comprehension of the required development tasks. Consequently, the document primarily targets developers and managers who bear the responsibility for system development.

2.2 Architectural Context diagram (ACD) versus Context Flow Diagram (CFD)

2.2.1 Architectural Context diagram (HOW overview)



2.2.2 Architectural Context diagram (WHAT overview)

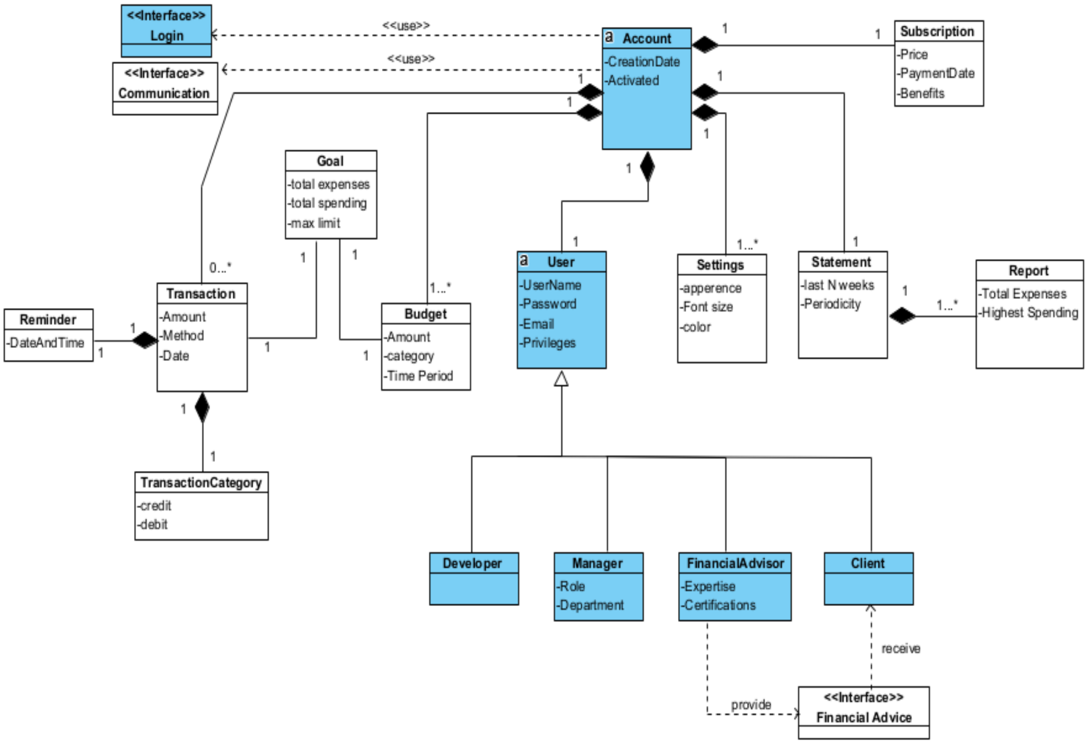


Section 3: Modularization

3.1 Partition the analysis model

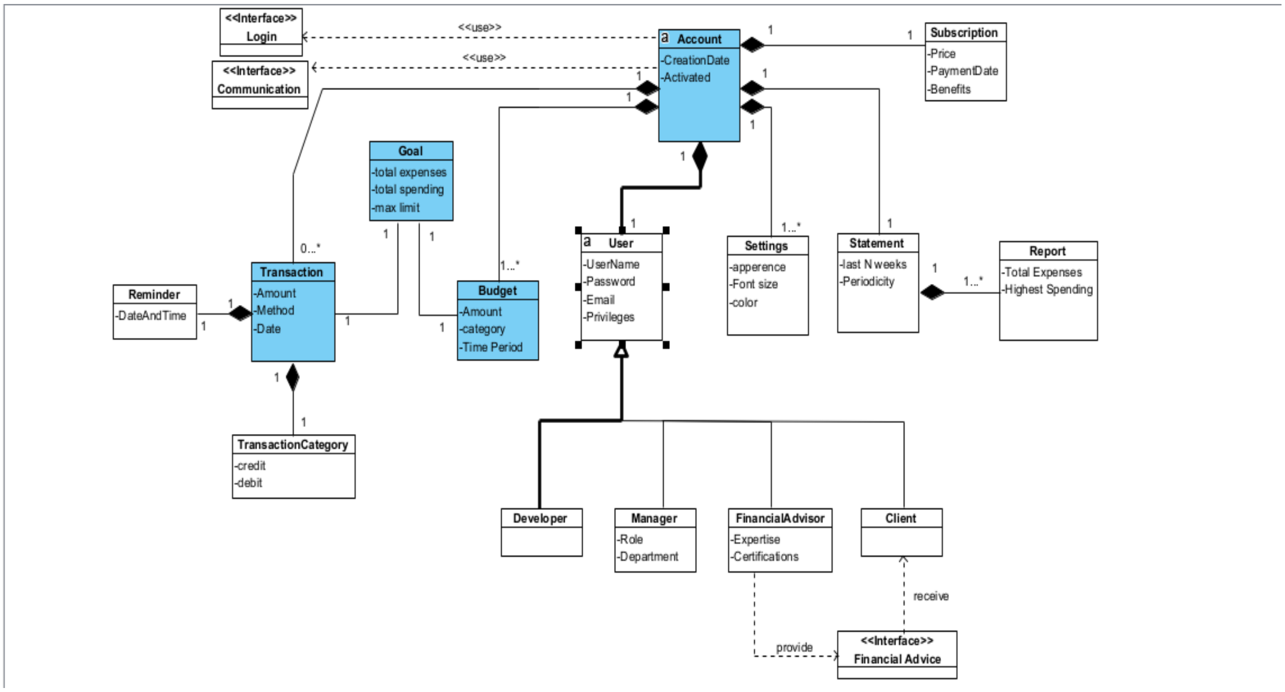
3.1.1 Login and Registration Subsystem

- Account
- User
- Developer
- Manager
- Financial Advisor
- Client



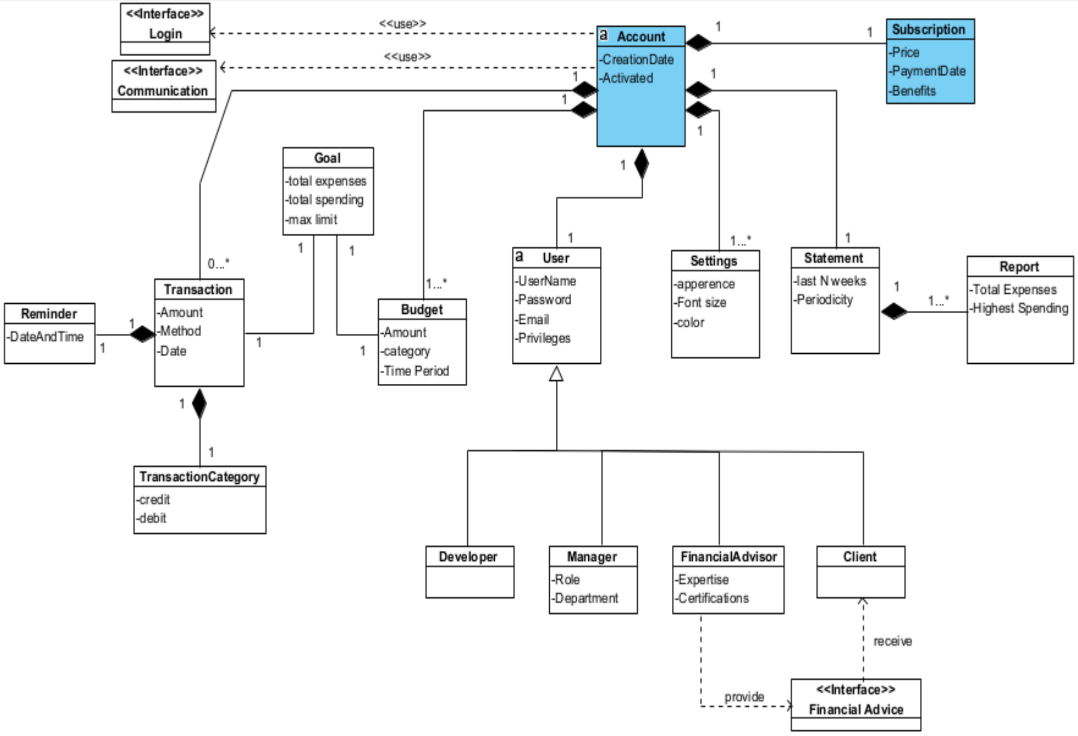
3.1.2 Budget Planning Subsystem

- Account
- Goal
- Transaction
- Budget



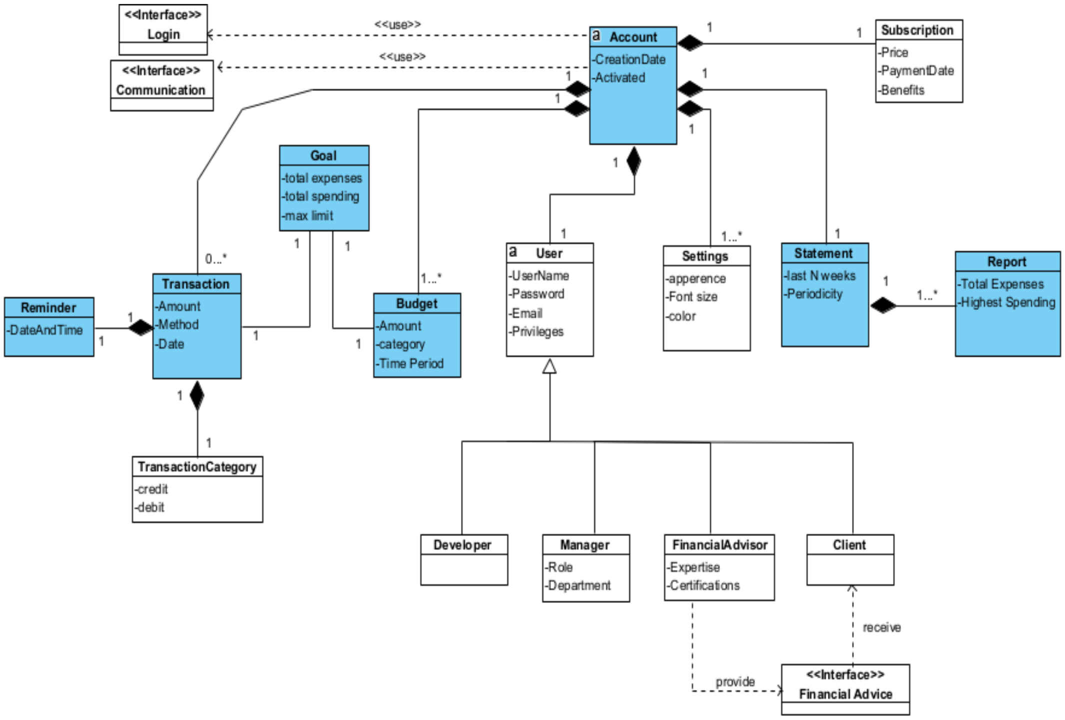
3.1.3 Subscription Manager Subsystem

- Account
- Subscription



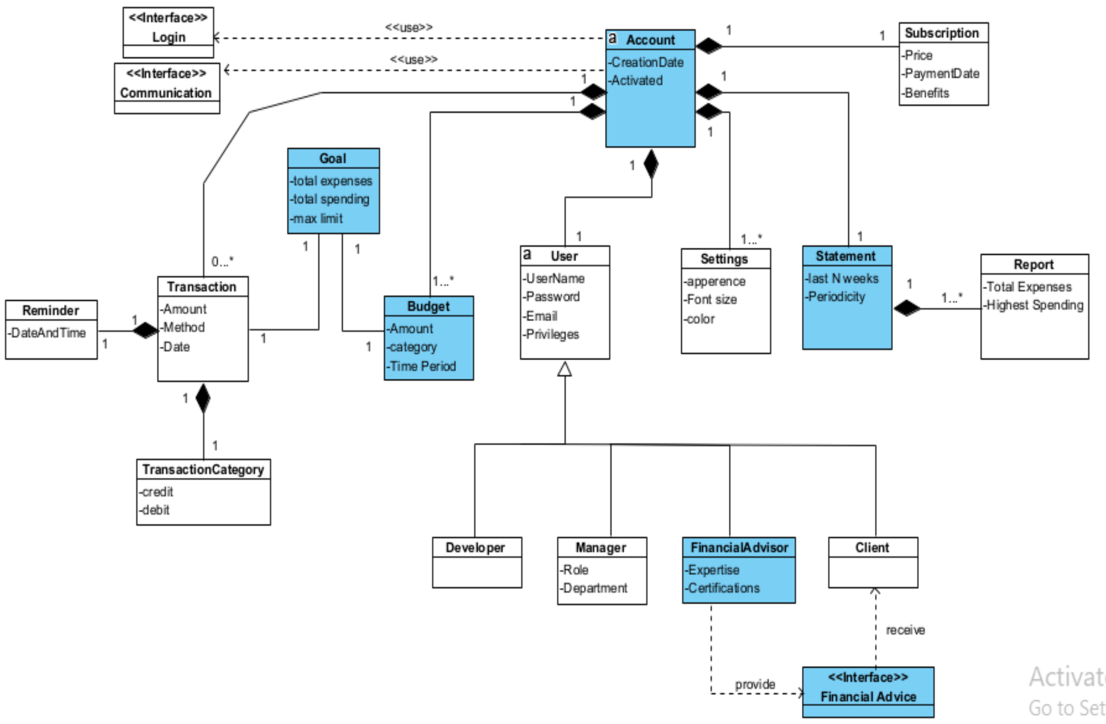
3.1.4 Tracking and Alert Subsystem

- Account
- Goal
- Transaction
- Budget
- Reminder
- Statement
- Report



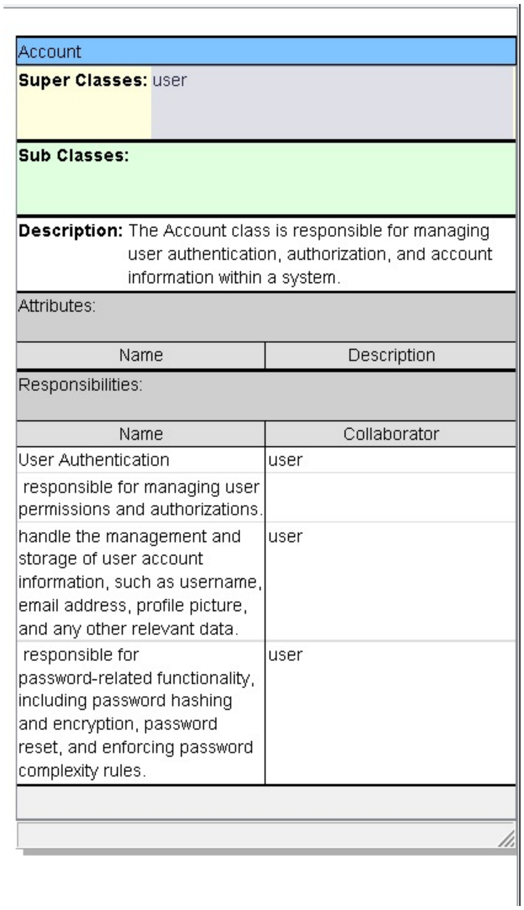
3.1.5 Financial advising Subsystem

- Account
- Goal
- Budget
- Statement
- Financial Advisor



3.2 Class Responsibility Collaboration (CRC)

3.2.1 Login and Registration Subsystem



Account

Super Classes: user

Sub Classes:

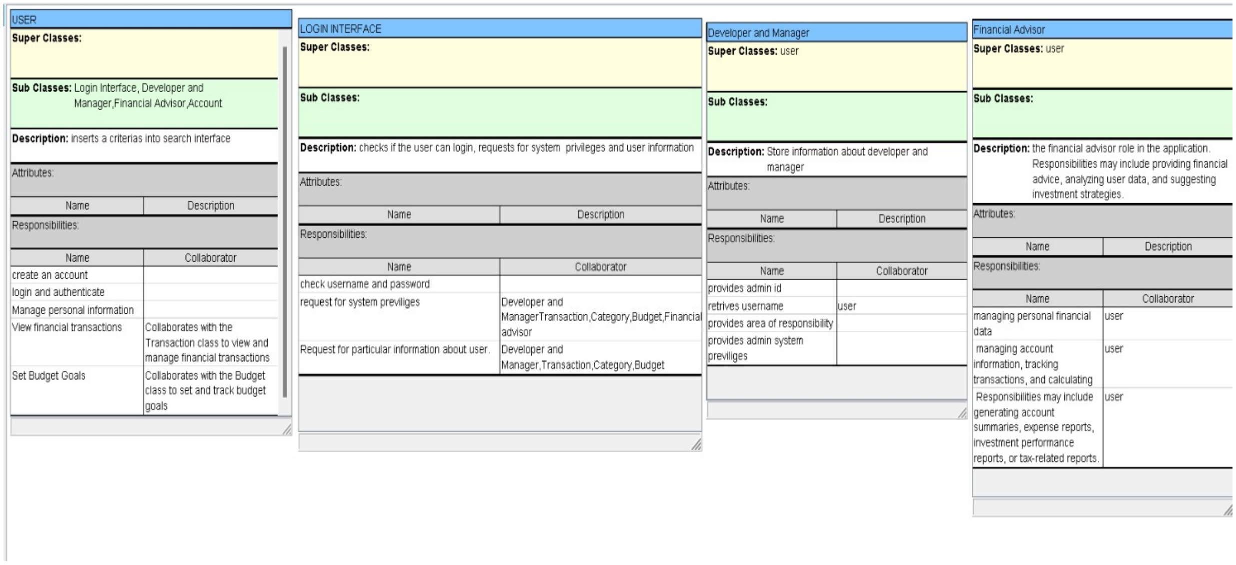
Description: The Account class is responsible for managing user authentication, authorization, and account information within a system.

Attributes:

Name	Description

Responsibilities:

Name	Collaborator
User Authentication	user
responsible for managing user permissions and authorizations.	
handle the management and storage of user account information, such as username, email address, profile picture, and any other relevant data.	user
responsible for password-related functionality, including password hashing and encryption, password reset, and enforcing password complexity rules.	user



USER

Super Classes:

Sub Classes: Login Interface, Developer and Manager,Financial Advisor,Account

Description: inserts a criterias into search interface

Attributes:

Name	Description

Responsibilities:

Name	Collaborator
create an account	
login and authenticate	
Manage personal information	
View financial transactions	Collaborates with the Transaction class to view and manage financial transactions
Set Budget Goals	Collaborates with the Budget class to set and track budget goals

LOGIN INTERFACE

Super Classes:

Sub Classes:

Description: checks if the user can login, requests for system privileges and user information

Attributes:

Name	Description

Responsibilities:

Name	Collaborator
check username and password	
request for system previliges	Developer and ManagerTransaction,Category,Budget,Financial advisor
Request for particular information about user.	Developer and Manager,Transaction,Category,Budget

Developer and Manager

Super Classes: user

Sub Classes:

Description: Store information about developer and manager

Attributes:

Name	Description

Responsibilities:

Name	Collaborator
provides admin id	
retrives username	user
provides area of responsibility	
provides admin system previliges	

Financial Advisor

Super Classes: user

Sub Classes:

Description: the financial advisor role in the application. Responsibilities may include providing financial advice, analyzing user data, and suggesting investment strategies.

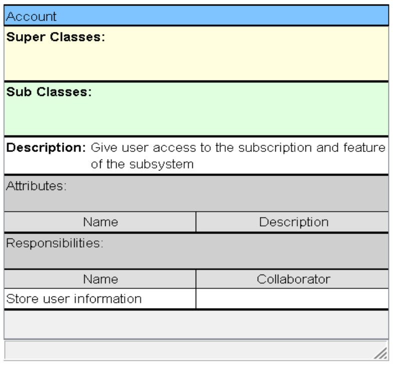
Attributes:

Name	Description

Responsibilities:

Name	Collaborator
managing personal financial data	user
managing account information, tracking transactions, and calculating	user
Responsibilities may include generating account summaries, expense reports, investment performance reports, or tax-related reports.	user

3.2.2 Subscription Manager



Account

Super Classes:

Sub Classes:

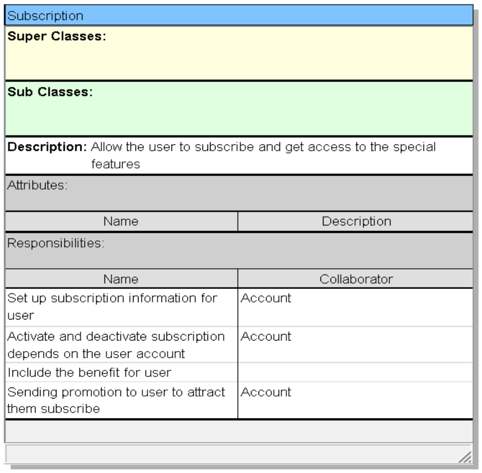
Description: Give user access to the subscription and feature of the subsystem

Attributes:

Name	Description

Responsibilities:

Name	Collaborator
Store user information	



Subscription

Super Classes:

Sub Classes:

Description: Allow the user to subscribe and get access to the special features

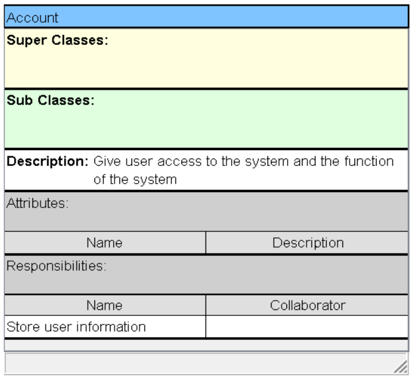
Attributes:

Name	Description

Responsibilities:

Name	Collaborator
Set up subscription information for user	Account
Activate and deactivate subscription depends on the user account	Account
Include the benefit for user	
Sending promotion to user to attract them subscribe	Account

3.2.3 Budget Planning



Account

Super Classes:

Sub Classes:

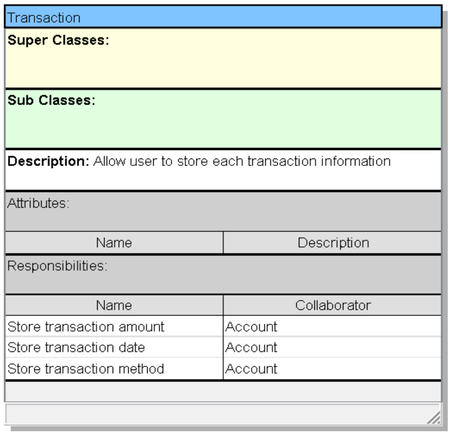
Description: Give user access to the system and the function of the system

Attributes:

Name	Description

Responsibilities:

Name	Collaborator
Store user information	



Transaction

Super Classes:

Sub Classes:

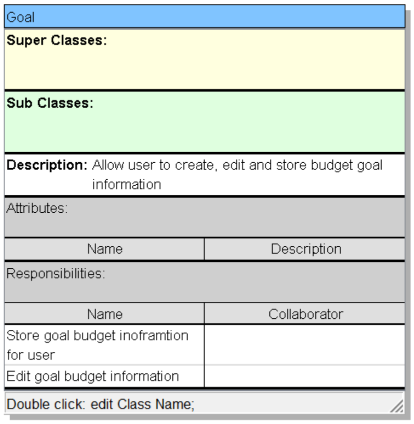
Description: Allow user to store each transaction information

Attributes:

Name	Description

Responsibilities:

Name	Collaborator
Store transaction amount	Account
Store transaction date	Account
Store transaction method	Account



Goal

Super Classes:

Sub Classes:

Description: Allow user to create, edit and store budget goal information

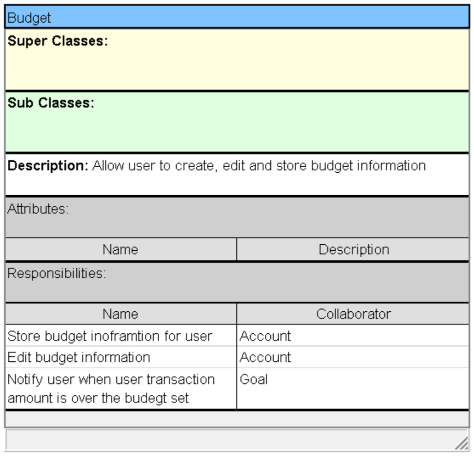
Attributes:

Name	Description

Responsibilities:

Name	Collaborator
Store goal budget inoframtion for user	
Edit goal budget information	

Double click: edit Class Name;



Budget

Super Classes:

Sub Classes:

Description: Allow user to create, edit and store budget information

Attributes:

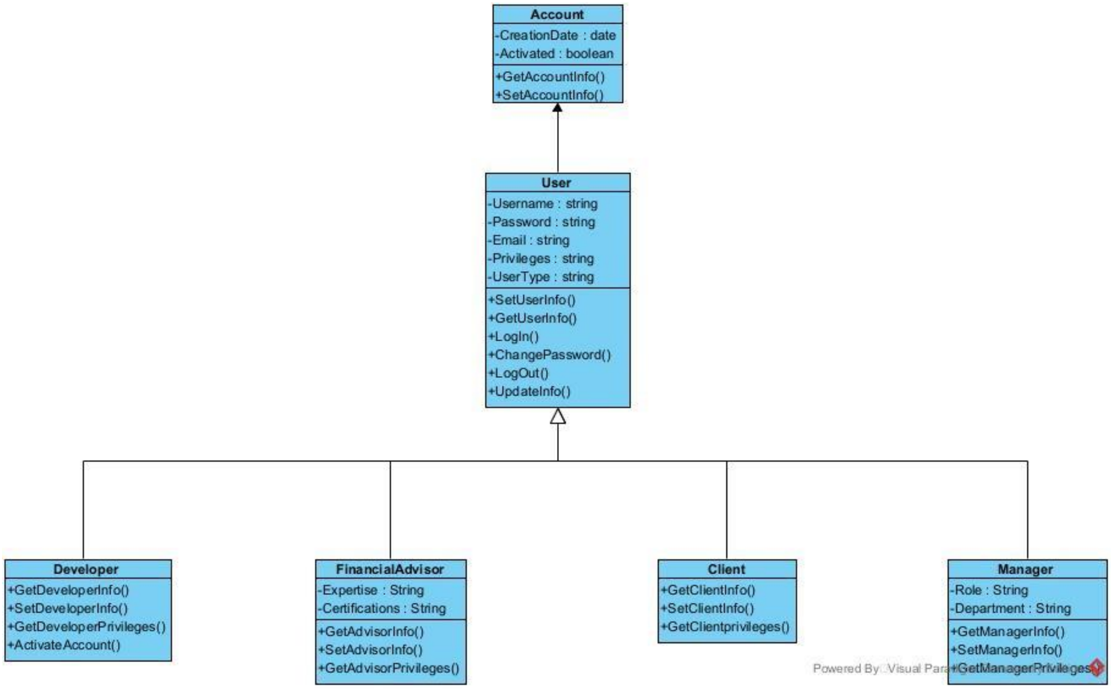
Name	Description

Responsibilities:

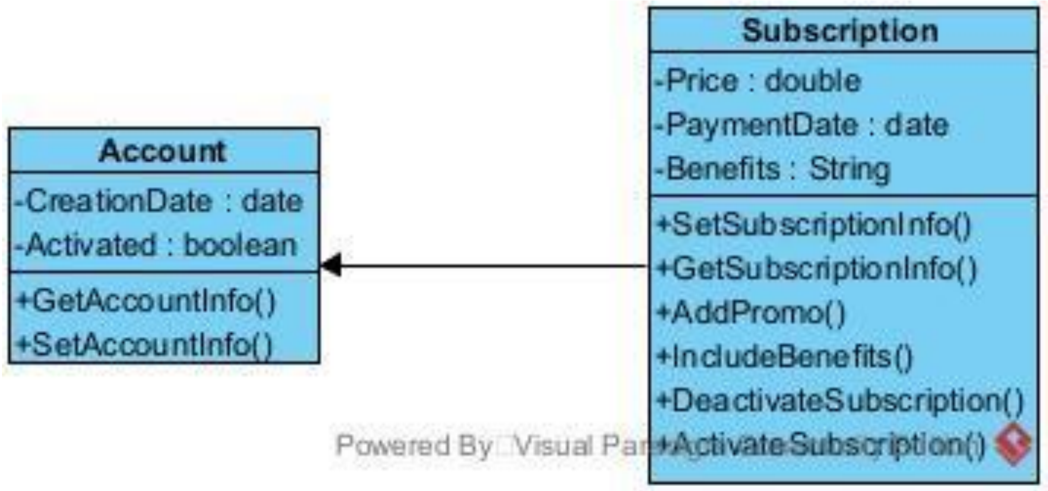
Name	Collaborator
Store budget inoframtion for user	Account
Edit budget information	Account
Notify user when user transaction amount is over the budegt set	Goal

3.3 Design Classes diagram

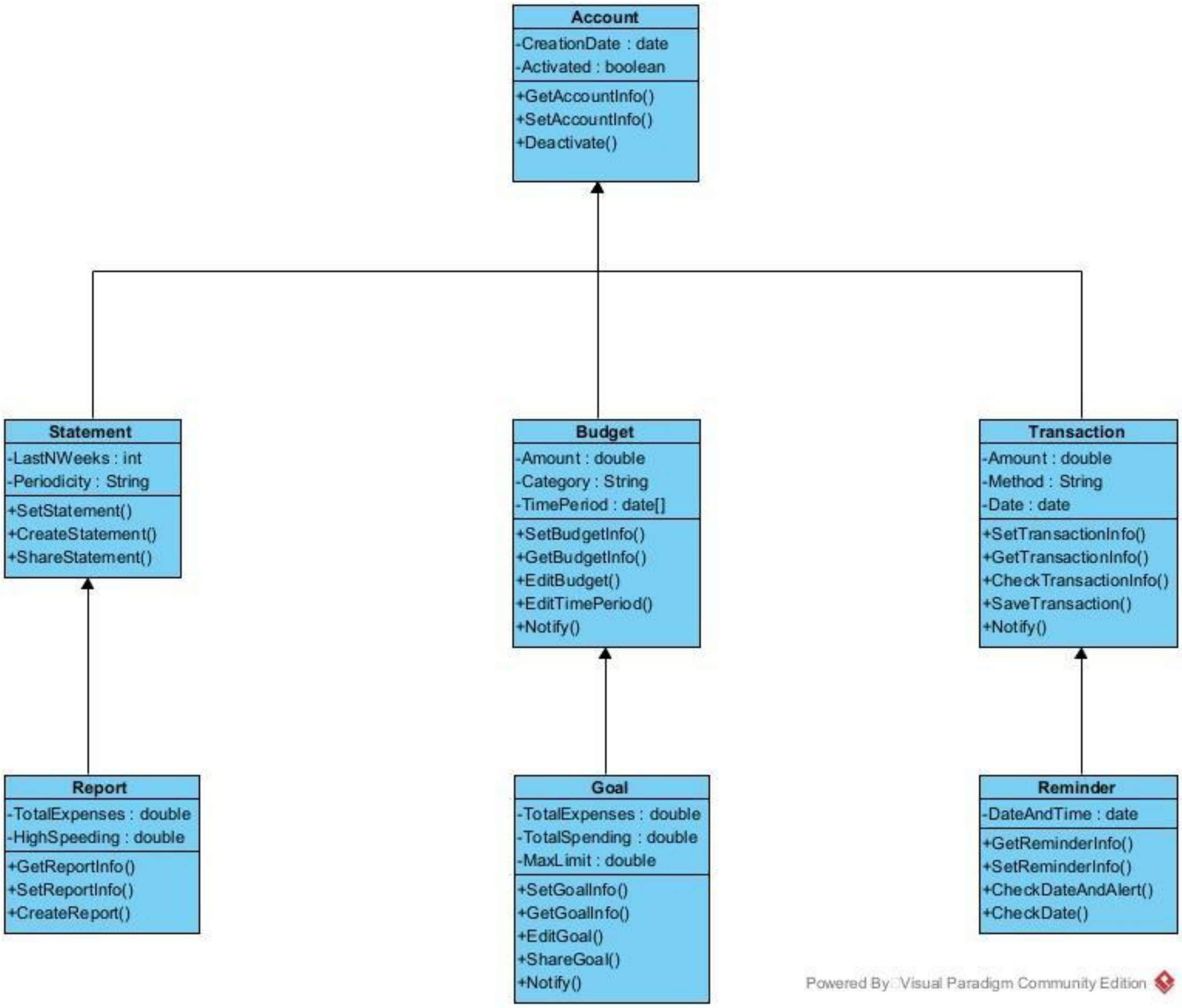
3.3.1 Login and Registration Subsystem



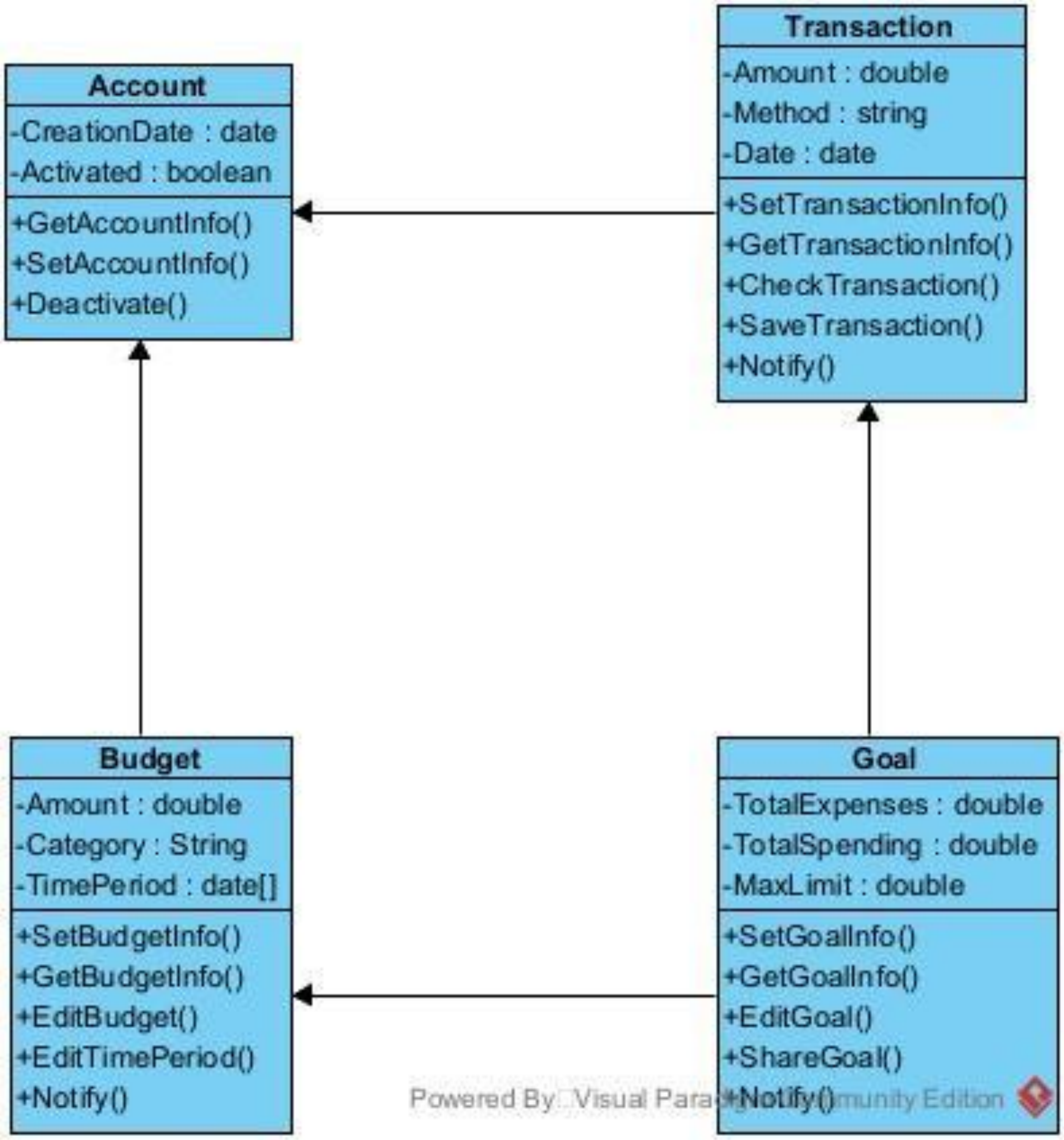
3.3.2 Subscription Manager Subsystem



3.3.3 Tracking and Alert Subsystem



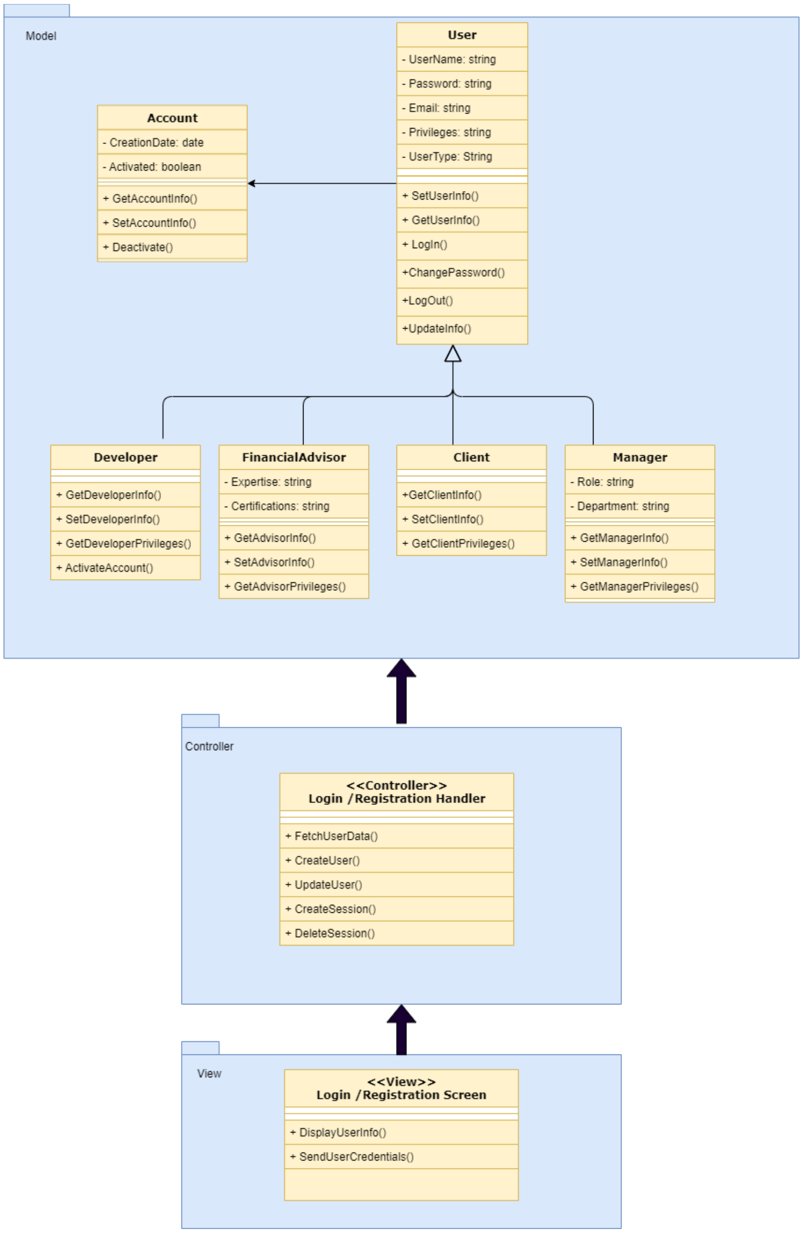
3.3.4 Budget Planning Subsystem



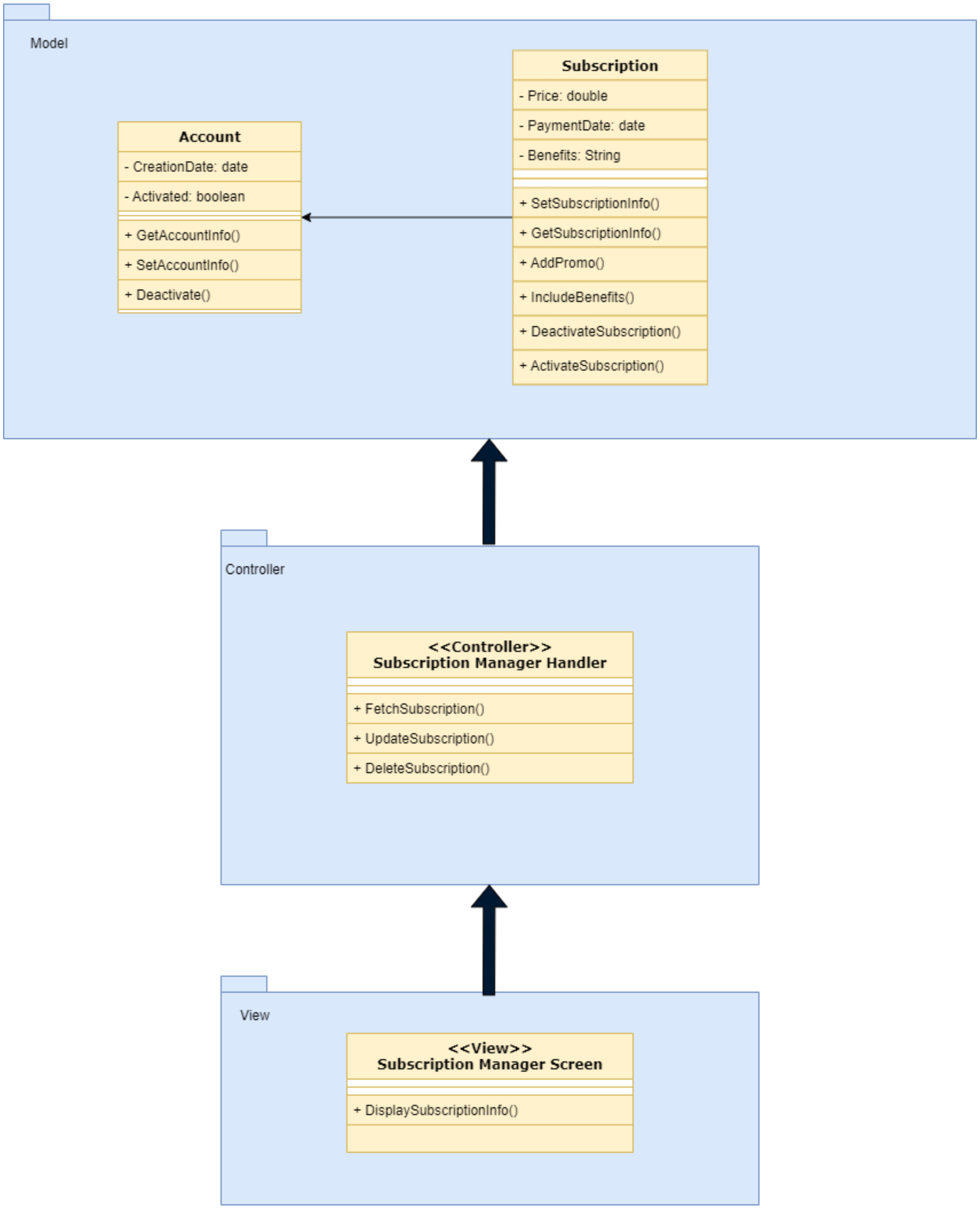
Section 4: Framework M(odel) V(iew) C(ontroller)

4.1 MVC Pattern diagram to Include

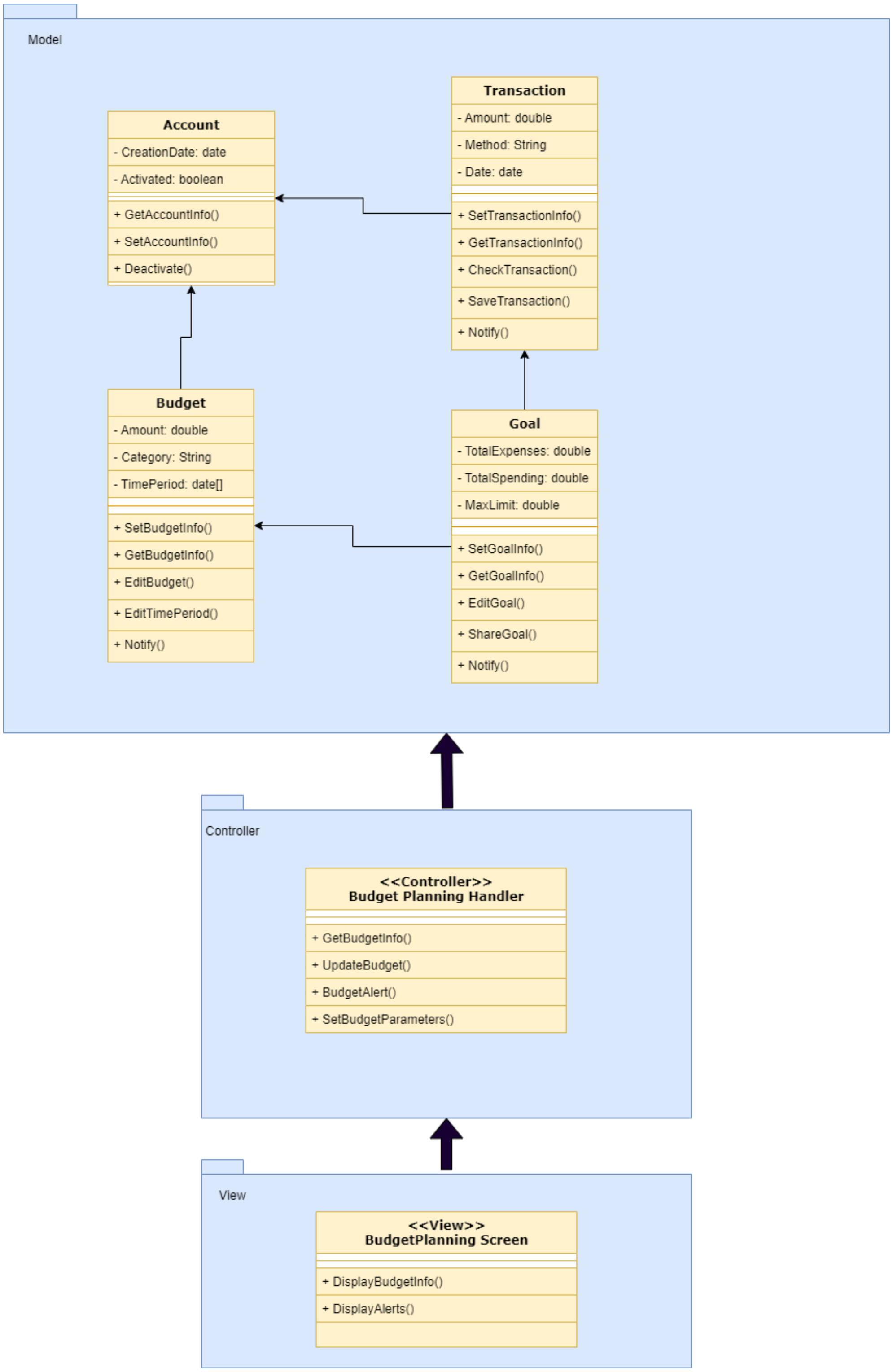
4.1.1 Login and Registration Subsystem



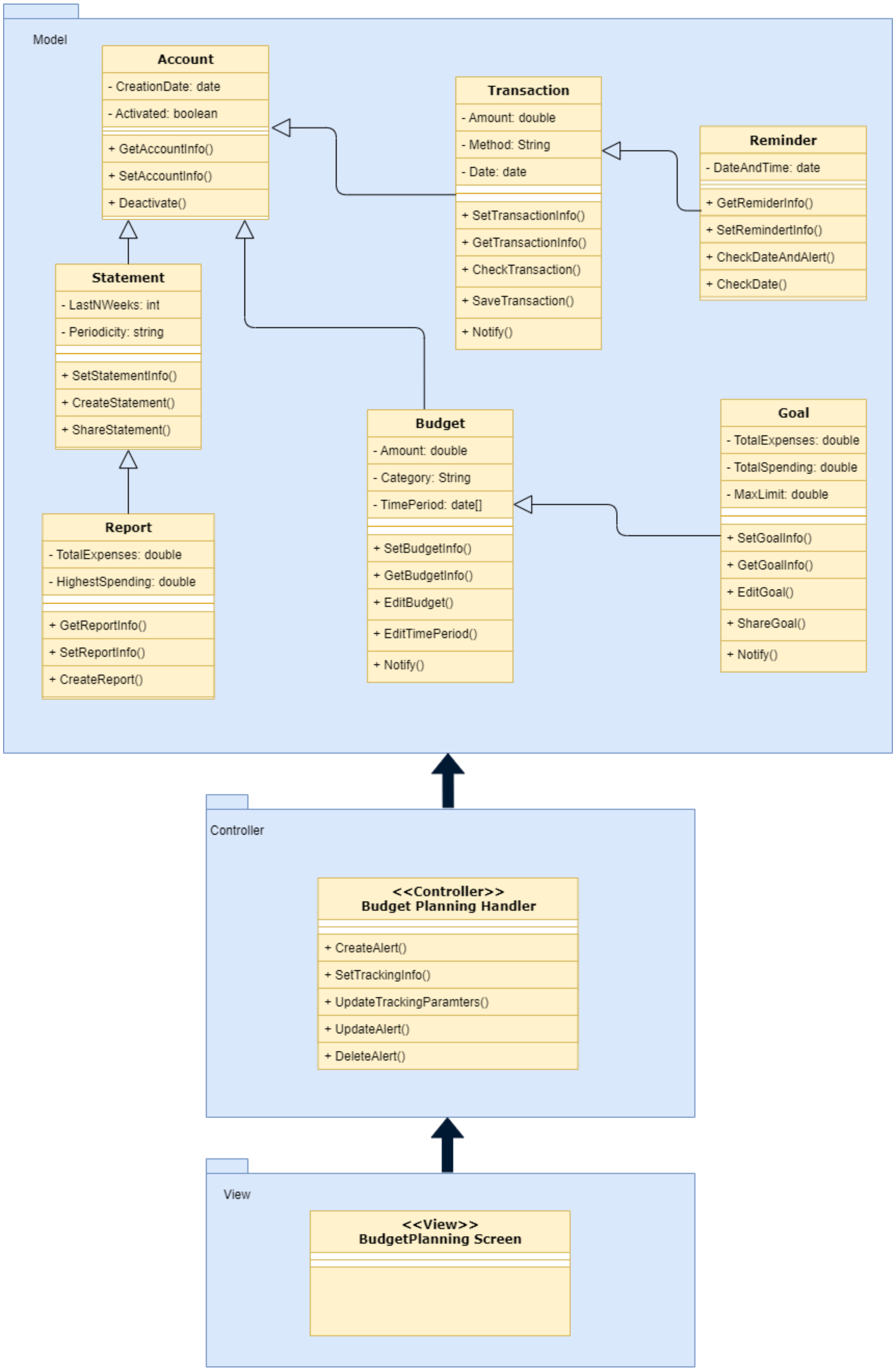
4.1.2 Subscription Manager Subsystem



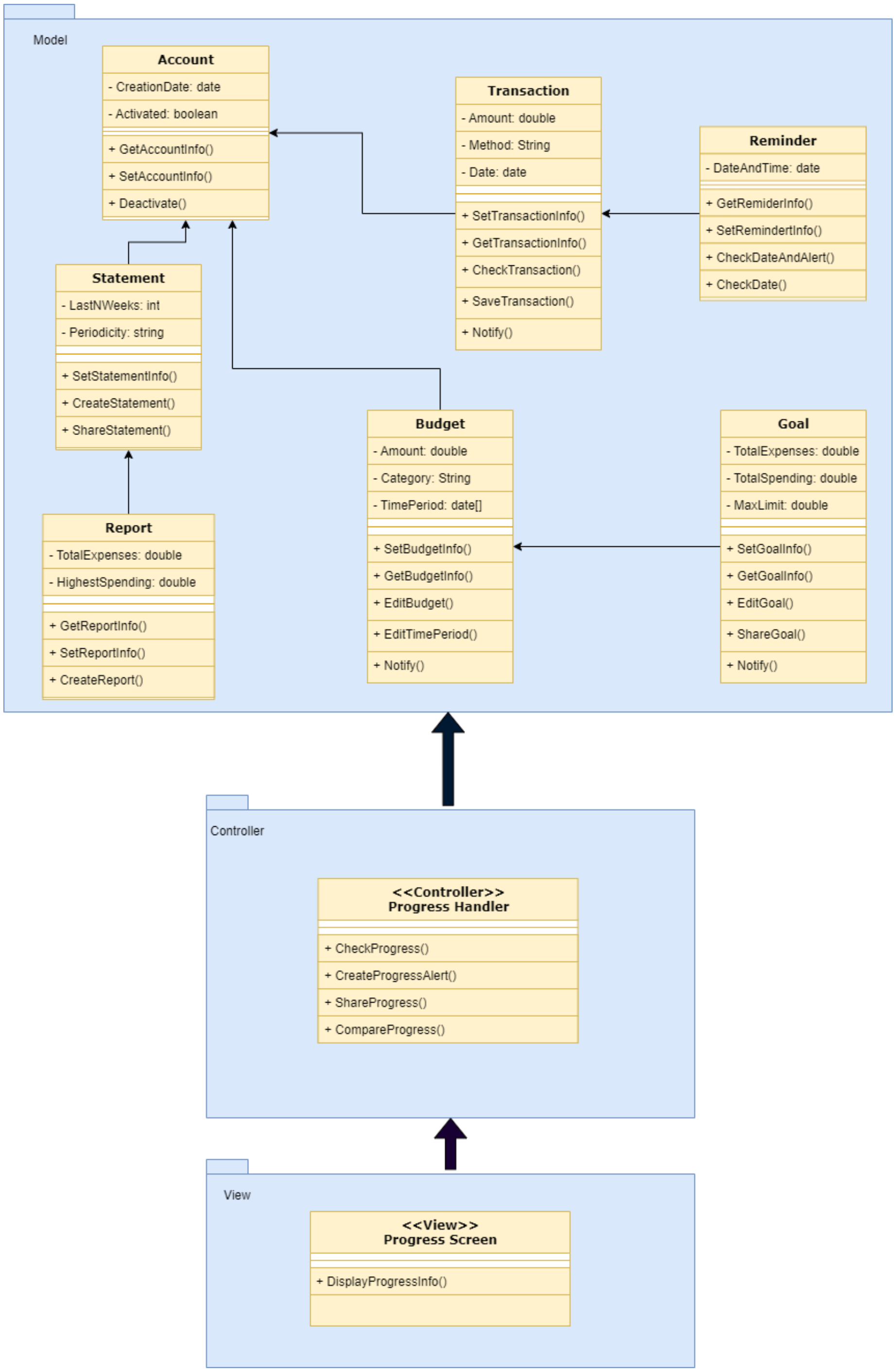
4.1.3 Budget Planning Subsystem



4.1.3 Tracking and Alert Subsystem

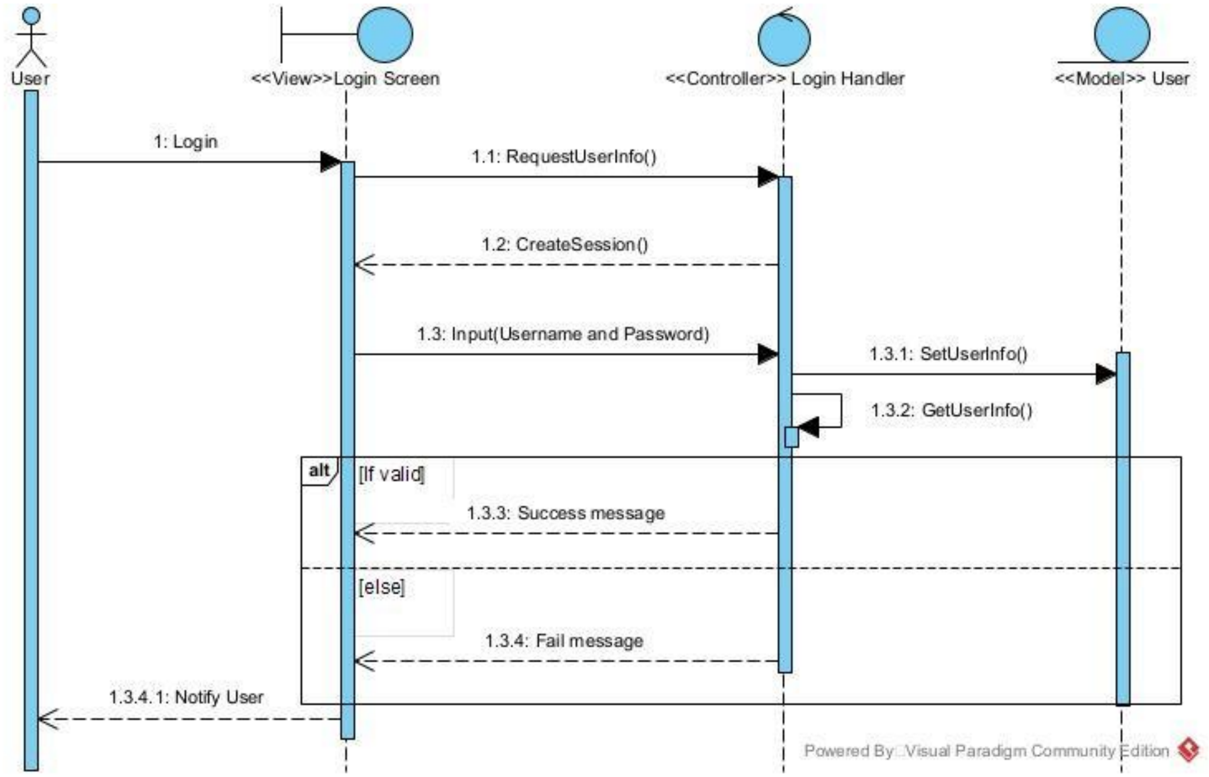


4.1.3 Progress Subsystem

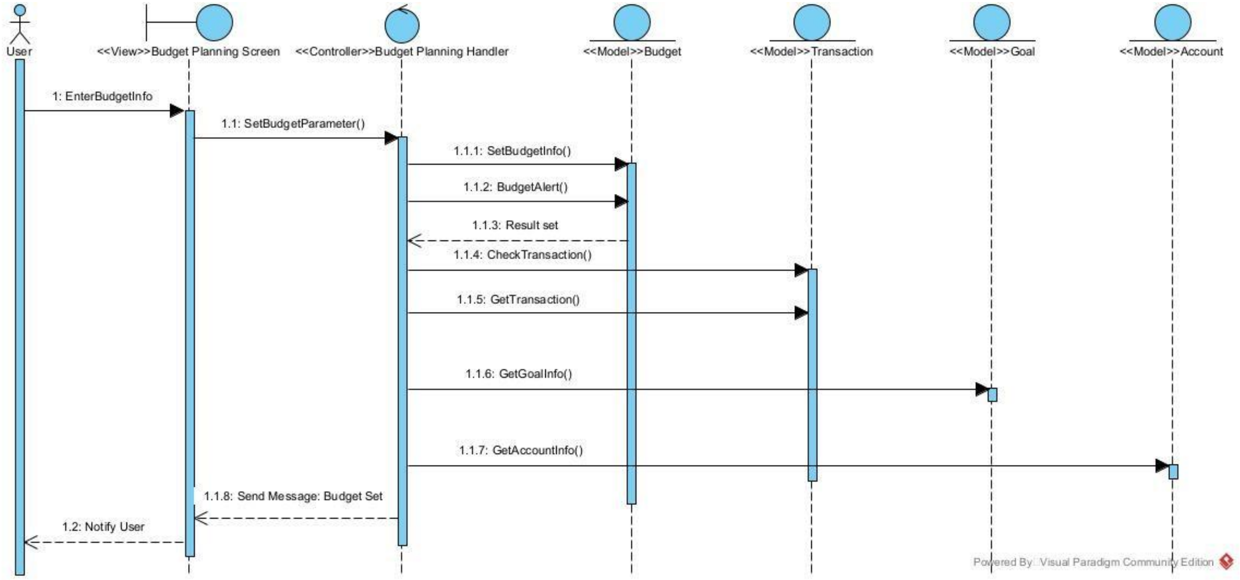


4.2 Full Sequence Diagrams

4.2.1 Login Subsystem (Use case: Login to the App)

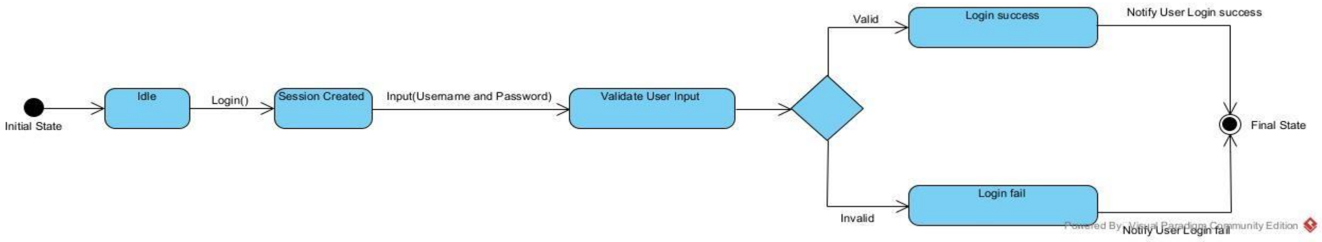


4.2.2 Budget Planning Subsystem (Use case: Set up budget)

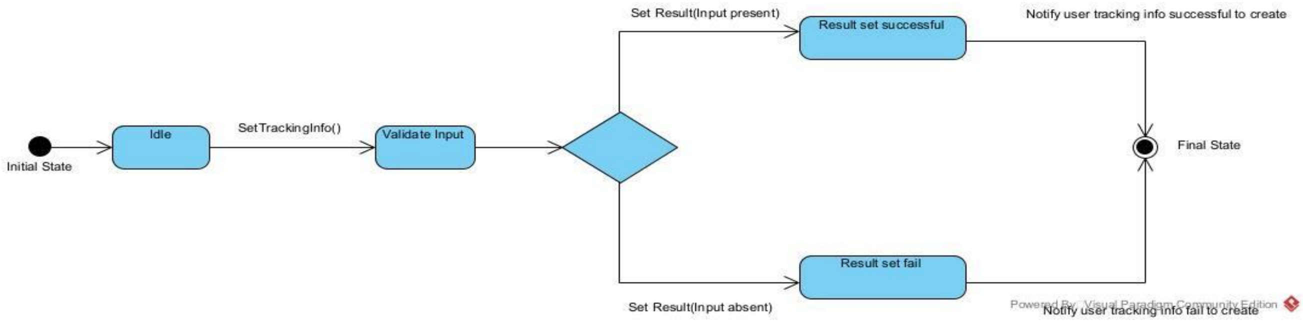


4.3 Full State Machine Diagrams

4.3.1 Login Subsystem (Use case: Login to the App)

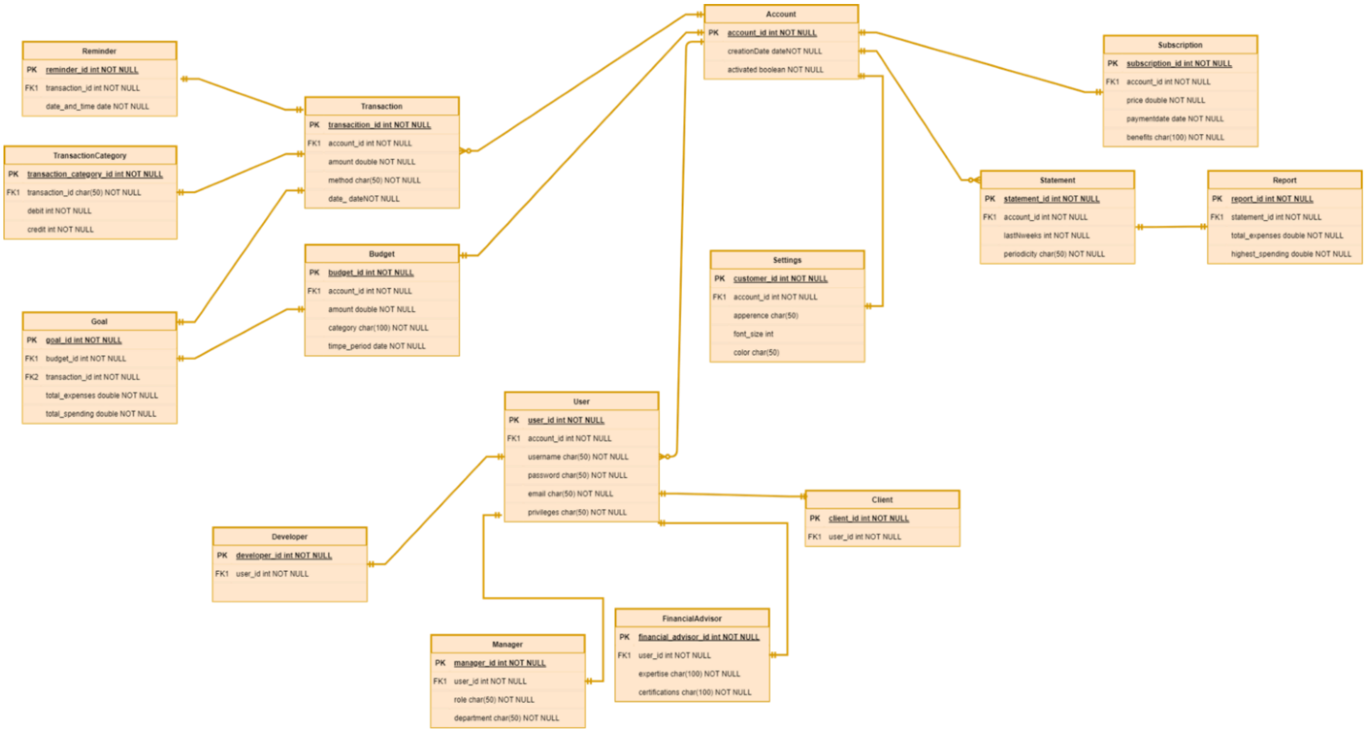


4.3.2 Budget Planning Subsystem (Use case: Set up budget)


Initial State
Idle
SetTrackingInfo()
Validate Input
Set Result(Input present)
Result set successful
Notify user tracking info successful to create
Final State
Set Result(Input absent)
Result set fail
Notify user tracking info fail to create
Powered By Visual Paradigm Community Edition

Section 5: Data Layer

5.1. Database Schema.

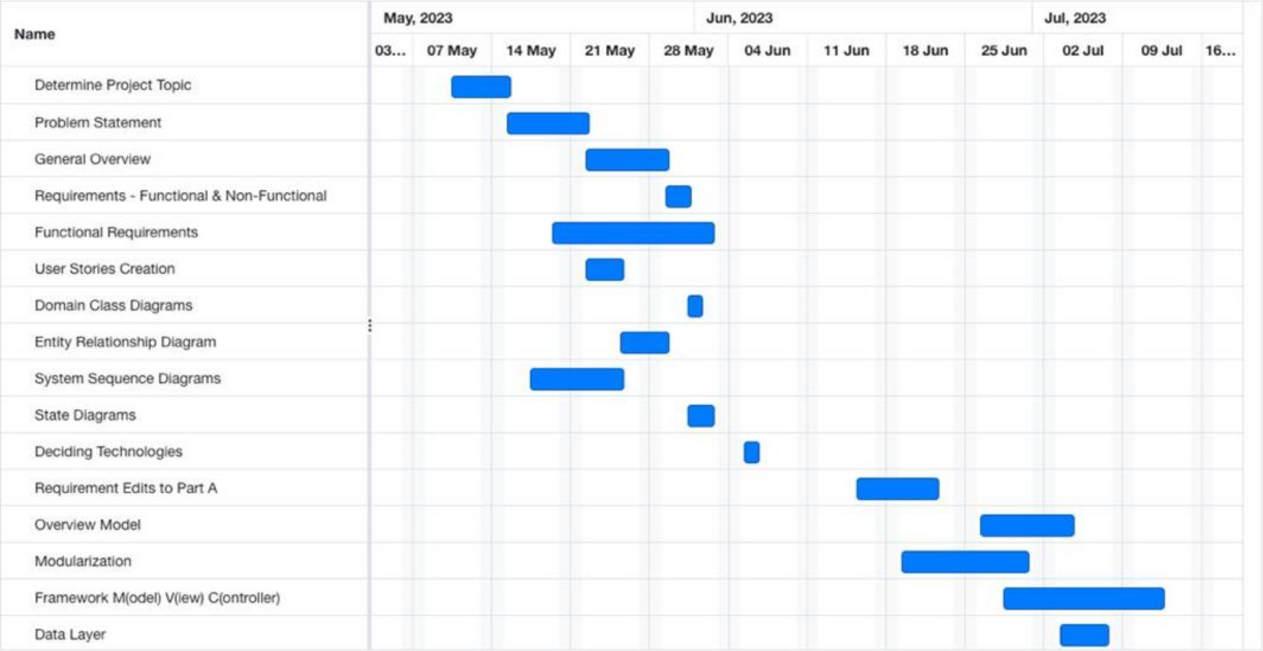

Reminder
PK reminder_id int NOT NULL
FK1 transaction_id int NOT NULL
date_and_time date NOT NULL
TransactionCategory
PK transaction_category_id int NOT NULL
FK1 transaction_id char(50) NOT NULL
debit int NOT NULL
credit int NOT NULL
Goal
PK goal_id int NOT NULL
FK1 budget_id int NOT NULL
FK2 transaction_id int NOT NULL
total_expenses double NOT NULL
total_spending double NOT NULL
Transaction
PK transacition_id int NOT NULL
FK1 account_id int NOT NULL
amount double NOT NULL
method char(50) NOT NULL
date_ dateNOT NULL
Budget
PK budget_id int NOT NULL
FK1 account_id int NOT NULL
amount double NOT NULL
category char(100) NOT NULL
timpe_period date NOT NULL
Account
PK account_id int NOT NULL
creationDate dateNOT NULL
activated boolean NOT NULL
Subscription
PK subscription_id int NOT NULL
FK1 account_id int NOT NULL
price double NOT NULL
paymentdate date NOT NULL
benefits char(100) NOT NULL
Statement
PK statement_id int NOT NULL
FK1 account_id int NOT NULL
lastNweeks int NOT NULL
periodicity char(50) NOT NULL
Report
PK report_id int NOT NULL
FK1 statement_id int NOT NULL
total_expenses double NOT NULL
highest_spending double NOT NULL
Settings
PK customer_id int NOT NULL
FK1 account_id int NOT NULL
apperence char(50)
font_size int
color char(50)
User
PK user_id int NOT NULL
FK1 account_id int NOT NULL
username char(50) NOT NULL
password char(50) NOT NULL
email char(50) NOT NULL
privileges char(50) NOT NULL
Client
PK client_id int NOT NULL
FK1 user_id int NOT NULL
Developer
PK developer_id int NOT NULL
FK1 user_id int NOT NULL
FinancialAdvisor
PK financial_advisor_id int NOT NULL
FK1 user_id int NOT NULL
expertise char(100) NOT NULL
certifications char(100) NOT NULL
Manager
PK manager_id int NOT NULL
FK1 user_id int NOT NULL
role char(50) NOT NULL
department char(50) NOT NULL

5.2. Technology List Update.

It's been decided to discard the web application development and focus on the mobile app, as it is more comfortable to keep the financial information and features provided by the app as portable as possible.

Mobile App: React Native, Flutter, Xamarin, Ionic, PhoneGap/Cordova
Database: Oracle SQL

Section 6: Gantt Chart Update



Part C: System Design Documents

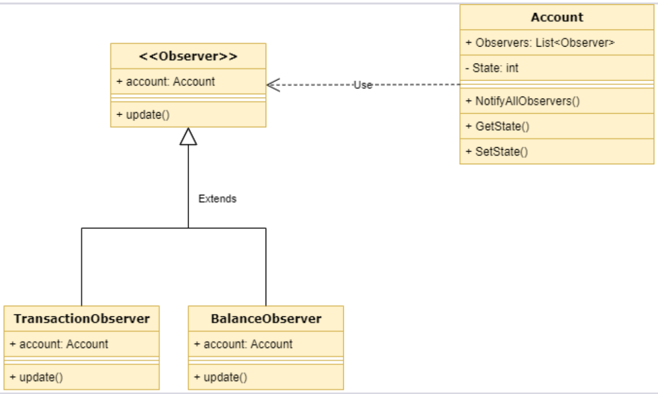
Section 1: Corrections to Design Specifications Part B

1.1 Corrections on the MVC section (Section 4)

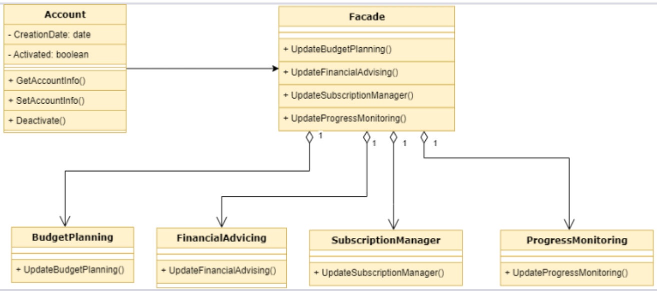
- The arrows connecting the model, the controller and the view are now corrected as mentioned in class.

Section 2: Software Design Patterns

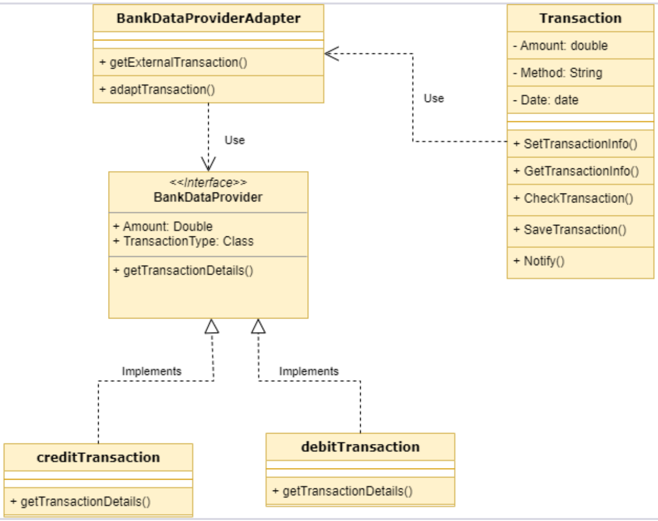
2.1. Observer Pattern:

Name	Observer Pattern
Problem	Real-time updates and notifications for user interactions and data changes, such as account transactions, balance updates, and budget modifications.
Solution	Establish a dependency between the account and various observers. When financial data changes, Observers are notified and update their displays automatically.
Graph	
Benefits & Consequences	Real-time updates for users, better user experience, decoupling of data and UI. However, can lead to potential performance issues if not optimized.

2.2. Facade Pattern:

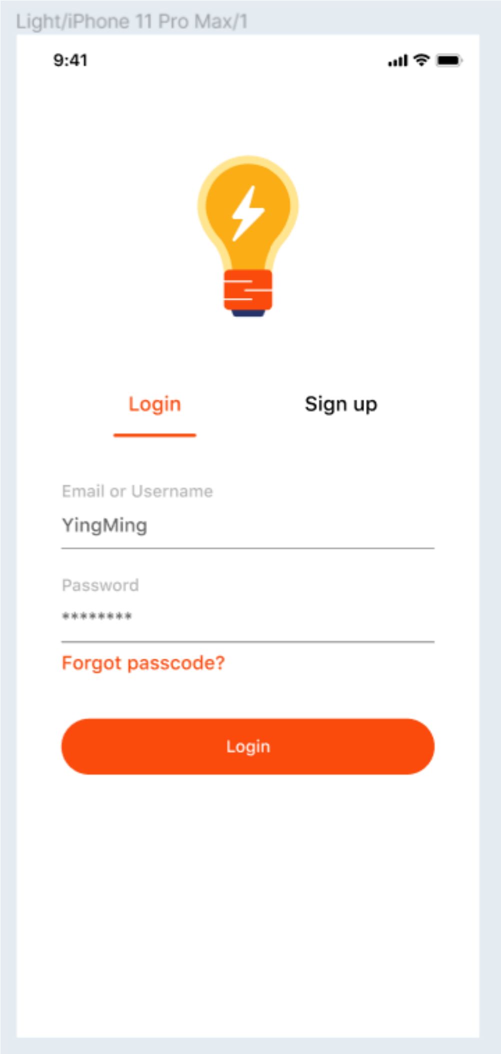
Name	Facade Pattern
Problem	Simplify user interactions with the financial app's complex subsystems, like account management, budgeting, progress monitoring, and financial advising.
Solution	Create a Facade that provides a single-entry point for users to interact with the app's features. The facade coordinates interactions with relevant subsystems behind the scenes.
Graph	 Account - CreationDate: date - Activated: boolean + GetAccountInfo() + SetAccountInfo() + Deactivate() Facade + UpdateBudgetPlanning() + UpdateFinancialAdvising() + UpdateSubscriptionManager() + UpdateProgressMonitoring() 1 1 1 1 BudgetPlanning + UpdateBudgetPlanning() FinancialAdvicing + UpdateFinancialAdvising() SubscriptionManager + UpdateSubscriptionManager() ProgressMonitoring + UpdateProgressMonitoring()
Benefits & Consequences	Simplifies user experience, shields complexity, promotes modularity. Consequences may include overloading the facade with too many responsibilities.

2.3. Adapter Pattern:

Name	Adapter Pattern
Problem	Integrating external financial data providers' APIs with your app's internal data structures and interfaces.
Solution	Create adapter classes that transform the external API's data and methods into your app's format, ensuring compatibility and smooth integration.
Graph	 BankDataProviderAdapter + getExternalTransaction() + adaptTransaction() Use <<Interface>> BankDataProvider + Amount: Double + TransactionType: Class + getTransactionDetails() Transaction - Amount: double - Method: String - Date: date + SetTransactionInfo() + GetTransactionInfo() + CheckTransaction() + SaveTransaction() + Notify() Use Implements Implements creditTransaction + getTransactionDetails() debitTransaction + getTransactionDetails()
Benefits & Consequences	Enables using external data sources without changing app's internal code, enhances data availability. Drawbacks include extra complexity and potential delays due to API calls.

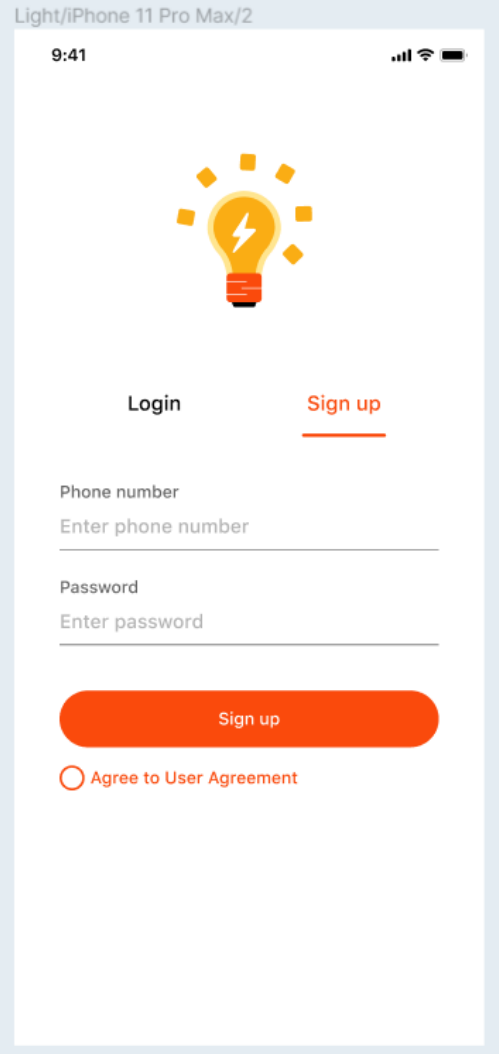
Section 3: UI/UX design

3.1. Login and Register:

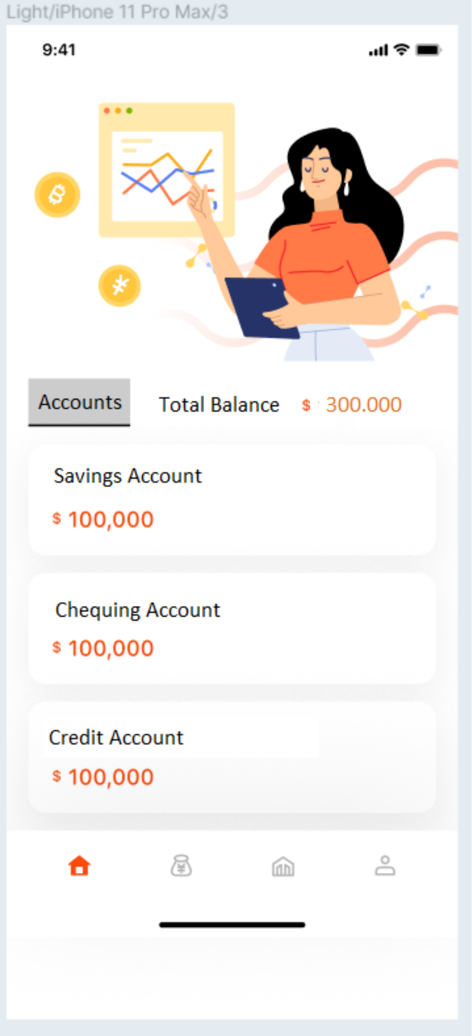

Light/iPhone 11 Pro Max/1

Email or Username: YingMing

Password: ********


Light/iPhone 11 Pro Max/2

3.2. Navigation:



Light/iPhone 11 Pro Max/3

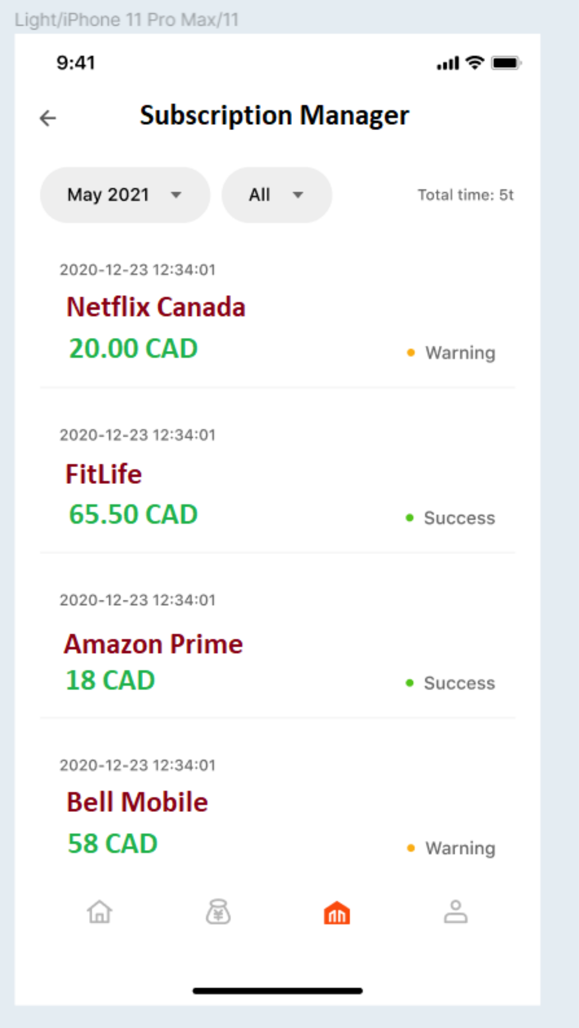
9:41

Accounts Total Balance $ 300.000

Savings Account
$ 100,000

Chequing Account
$ 100,000

Credit Account
$ 100,000



Light/iPhone 11 Pro Max/11

9:41

Subscription Manager

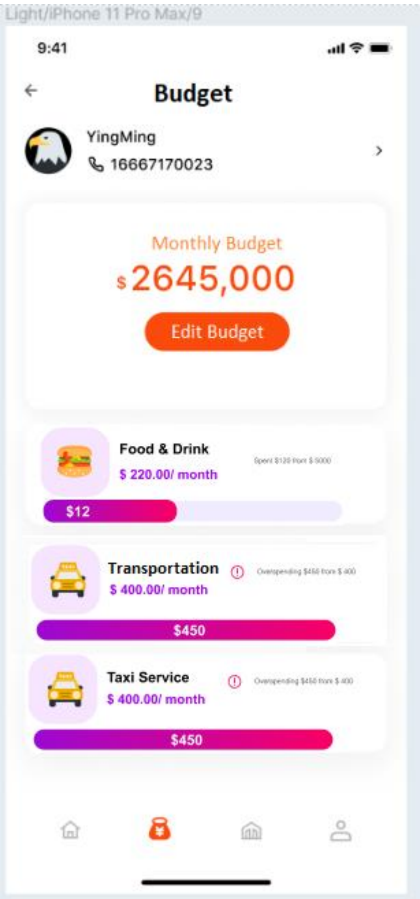
May 2021 ▾ All ▾ Total time: 5t

2020-12-23 12:34:01
Netflix Canada
20.00 CAD ● Warning

2020-12-23 12:34:01
FitLife
65.50 CAD ● Success

2020-12-23 12:34:01
Amazon Prime
18 CAD ● Success

2020-12-23 12:34:01
Bell Mobile
58 CAD ● Warning



Budget

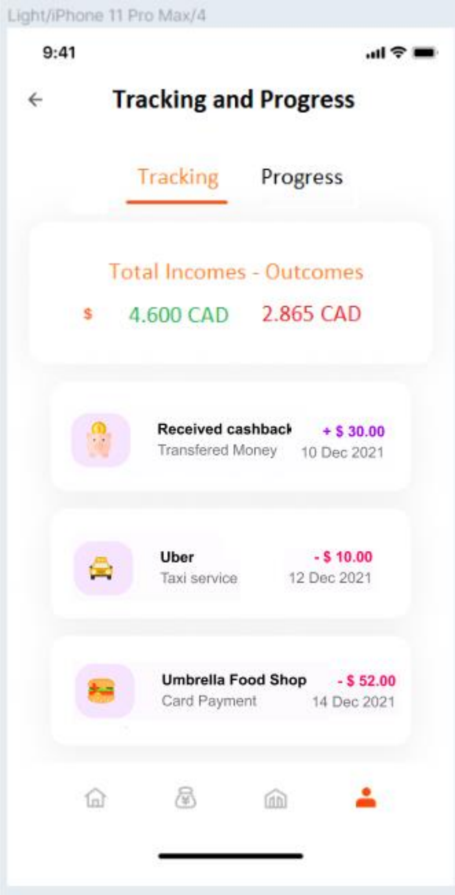
YingMing
16667170023

Monthly Budget
$2645,000

Food & Drink
$ 220.00/ month
Spent $120 from $ 5000
$12

Transportation
$ 400.00/ month
Overspending $450 from $ 400
$450

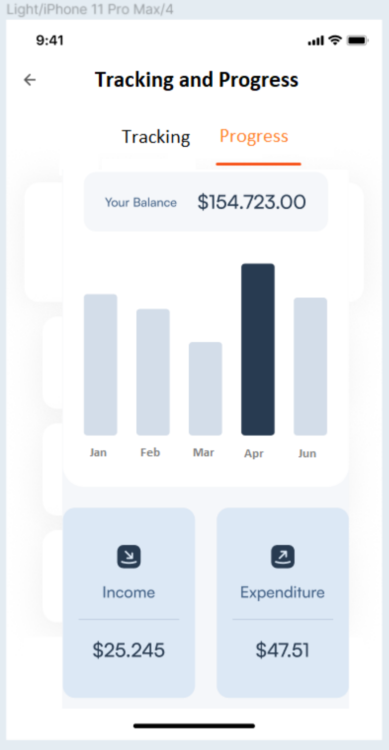
Taxi Service
$ 400.00/ month
Overspending $450 from $ 400
$450



Tracking and Progress

Total Incomes - Outcomes
$ 4.600 CAD 2.865 CAD

Received cashback Transfered Money	+ $ 30.00 10 Dec 2021
Uber Taxi service	- $ 10.00 12 Dec 2021
Umbrella Food Shop Card Payment	- $ 52.00 14 Dec 2021



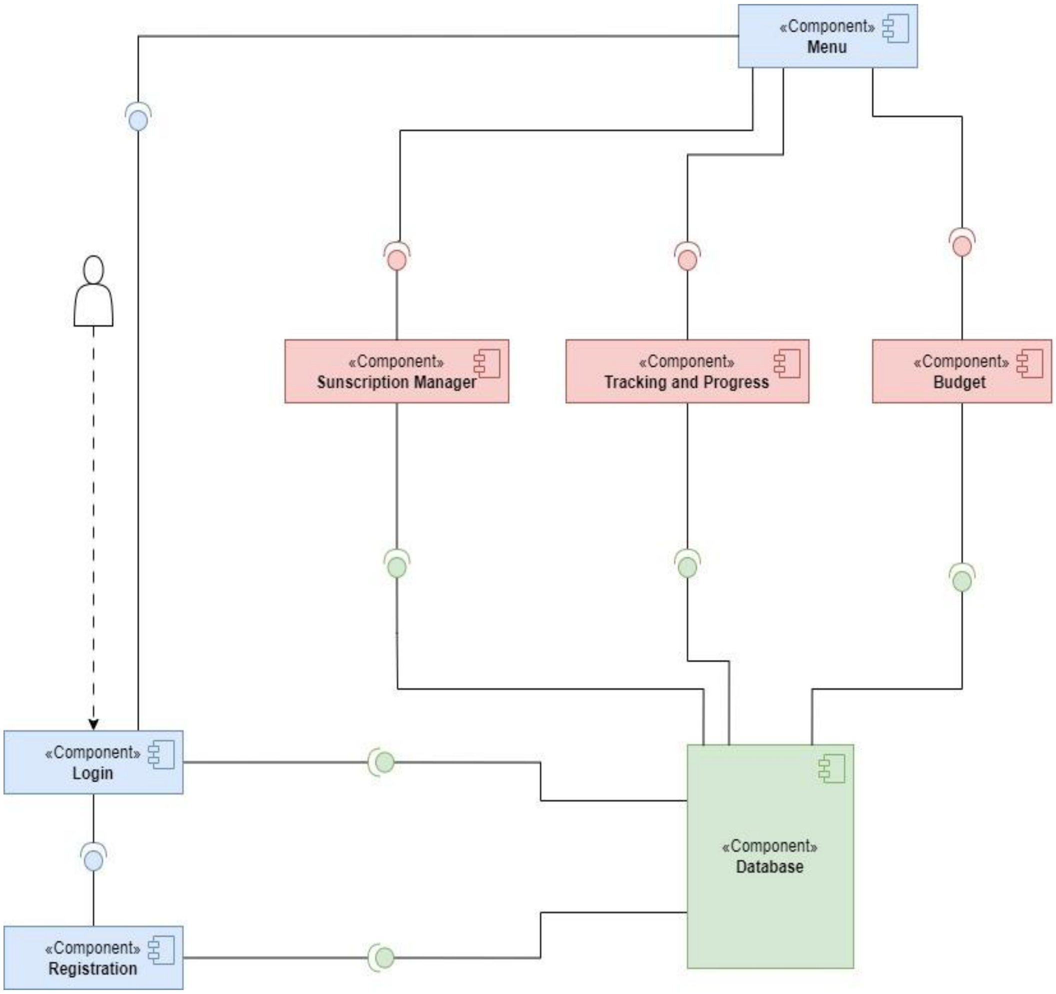
Tracking and Progress

Your Balance $154.723.00

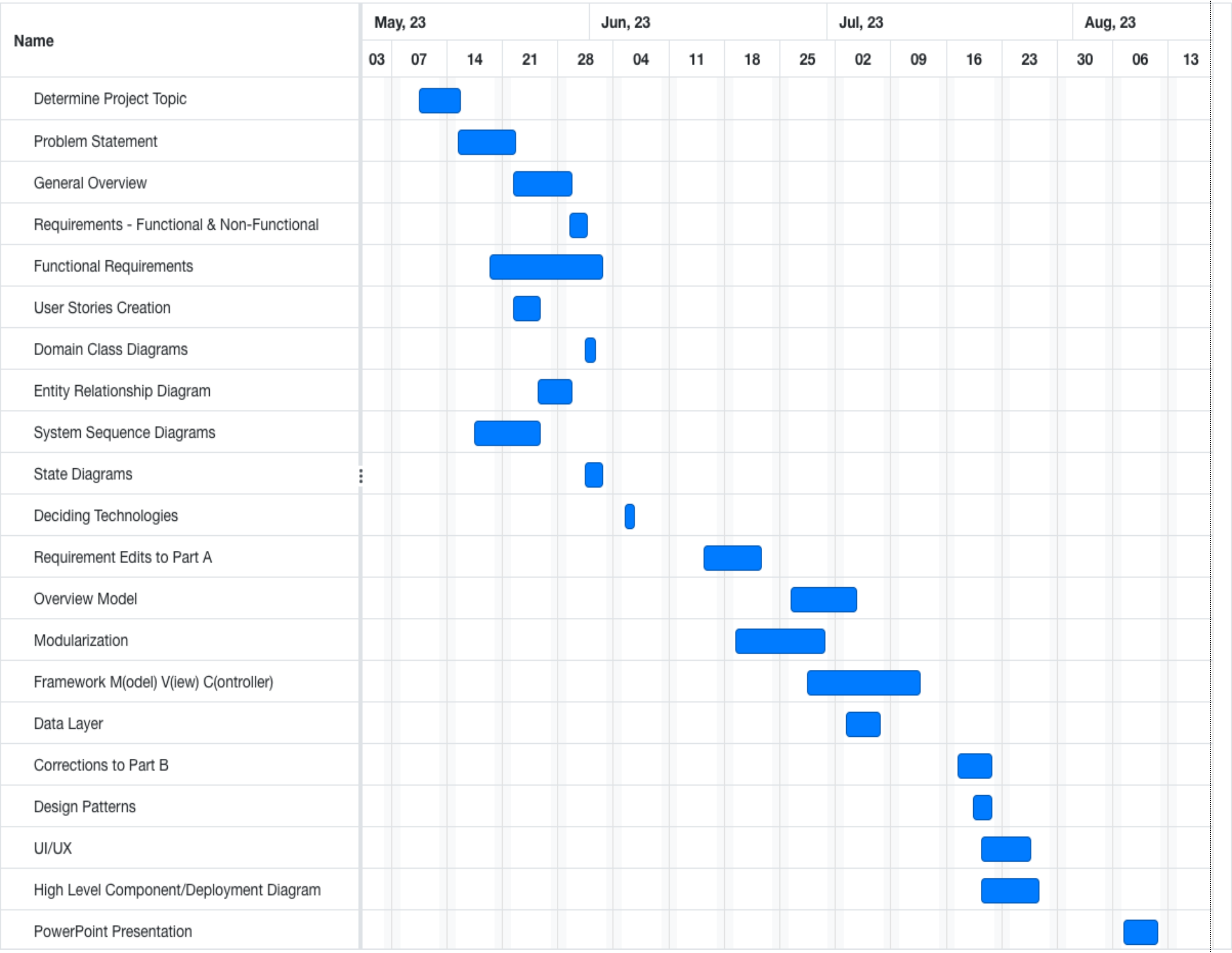
Income
$25.245

Expenditure
$47.51

Section 4: High Level Component/Deployment Diagram



Section 5: Gantt Chart


Name
May, 23
Jun, 23
Jul, 23
Aug, 23
Determine Project Topic
Problem Statement
General Overview
Requirements - Functional & Non-Functional
Functional Requirements
User Stories Creation
Domain Class Diagrams
Entity Relationship Diagram
System Sequence Diagrams
State Diagrams
Deciding Technologies
Requirement Edits to Part A
Overview Model
Modularization
Framework M(odel) V(iew) C(ontroller)
Data Layer
Corrections to Part B
Design Patterns
UI/UX
High Level Component/Deployment Diagram
PowerPoint Presentation