Cairo University
Faculty of Computers and Artificial Intelligence

CS251

Intro. to Software Engineering

Tharwa

Software Requirements Specifications

Version 1.0

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Mars of 2025

CS251: Phase 1 Optimum
Project: **Tharwa**

Software Requirements Specifications

Contents

Software Requirements Specifications

CS251: Phase 1 Optimum
Project: **Tharwa**

Software Requirements Specifications

Team

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Purpose

This document outlines the functional, non-functional, and technical requirements for the Personal Investment Management Software. It defines the system's purpose, features, scope, and key technologies to guide the development process.

Audience

1) Software Developers

2) Project Managers

3) UI/UX Designers

4) Testers & Quality Assurance Engineers

5) Stakeholders

Software Requirements Specifications

Introduction

Software Purpose

This app is designed to provide individuals with the ability to track and manage their financial investments across multiple asset types, including stocks, real estate, savings, and cryptocurrencies. Since one of our goals is to enhance financial literacy, we have added interactive learning modules to help users develop smarter money management habits. Additionally, the software automates budgeting and debt repayment to improve financial stability, offering personalized insights and recommendations based on real-time financial data. By integrating various financial sources and visualizing investment performance, this software enables users to make well-informed decisions and take control of their financial future.

Software Scope

- Portfolio Tracking – Monitor different assets and analyze investment performance.
- Financial Education – Interactive modules, quizzes, and AI-driven insights for money management.
- Goal-Based Budgeting – Set and track income, savings, and retirement goals.
- Debt Management – Automate debt repayments using a predefined percentage of income.
- Risk & Asset Allocation – Help users diversify investments and manage risks.
- Real-Time Data Integration – Sync with banking systems, brokerage accounts, and stock exchanges.
- Visualization & Reports – Provide detailed charts and graphs for financial analysis.

Software Requirements Specifications

Definitions, acronyms, and abbreviations

Phrase	Definition
ROI (Return on Investment)	A financial metric that calculates the profitability of an investment.
Portfolio Tracking	Monitoring different assets and investments in real-time.
Asset Allocation	The strategy of diversifying investments across different asset classes.
Net Worth Computation	A feature that calculates a user's total financial worth (assets - liabilities).
API (Application Programming Interface)	A set of protocols for integrating with banking systems, stock exchanges, and payment gateways.
Debt Management	Features that automate debt repayment using a predefined percentage of monthly income.
Unbanked & Underbanked	Individuals without full access to traditional banking services, relying on cash or mobile wallets.
Cloud-Based Deployment	Hosting the application on cloud services such as AWS, Google Cloud, or Azure for scalability.

Software Requirements Specifications

Requirements

Functional Requirements

Requirement ID	Requirement Statement
FR01	The First screen appears to the user is the login/sign-up screen
FR02	The application will redirect to the screen showing to two input boxes for the username and password in case the user chooses to log in .
FR03	The application checks the registered credentials for security and to enable the user to log in. Also, he could reset his/her password through sending link to his/her email
FR04	The application will show the signup screen if the user chooses to sign up showing some required fields to fill in such as name, username, password, email, phone number, country, city, National ID, Bank account number and Different investments.
FR05	The application will redirect you to your dashboard which consists of: 1. Some computations of net-worth and rate of investment 2. **Some graphs and visualizations** displaying how the investment flows and how much more do I need to reach the specified financial target. 3. **The financial obligations** that must be settled at specific times .

	4. **Presenting and auto-tracking the last updates in the investments .**
FR06	Also, the application provides some functionalities that could be done by viewing a panel to choose from as follows: 1. **Setting new targets**, as the investor has continuously renewable targets. 2. **Adding new investment sources and integrating them with the account**, as the growth of the investment the investor makes more investments through time so, the addition part is important for that reason. 3. **Identifying potential risks**, analyzing them and balances investments , which helps the users minimize risks and loss. 4. **Suggestions for enlarging your investments**. 5. **Providing some tutorials and educational activities** to learn how to invest efficiently and professionally and with minimizing risks . 6. **Offers retirement planning** , helping the users to plan for their retirement savings . 7. **Requesting assistance in managing the saving process**. 8. **Changing some information** for the user. 9. **Connect friends for asking**

Software Requirements Specifications

Non-Functional Requirements

Measures	Details
Performance	• The login\sign-up page should take less than 1 second to appear. • After the user enters his information, showing the dashboard should take less than 3 seconds. • The Dashboard should appear immediately after login in time end. • The system should respond to user actions within 2 seconds for 95% of requests • The application should handle at least 10,000+ concurrent users without performance degradation. • The app size should be low for all the low-end devices and old ones. • The app should put a limit for a transaction of money be less than or equal to 20,000 EGP
Scalability	• The system should scale to 1milion+ user without downtime
Reliability and availability	• If a server fails, requests should be redirected to a backup server within 5 seconds to prevent downtime.
Security	• All user data and transactions should be fully encrypted. • Users must authenticate using authentication apps for enhanced security • Use machine learning models to detect unusual transactions and block fraudulent activities. • Limit access based on user roles (e.g., admin, investor, customer support) to prevent unauthorized access. • Conduct monthly security tests to find and fix vulnerabilities before attackers do.
Usability	• The platform should be easy to use with a clear dashboard and real-time graphs.

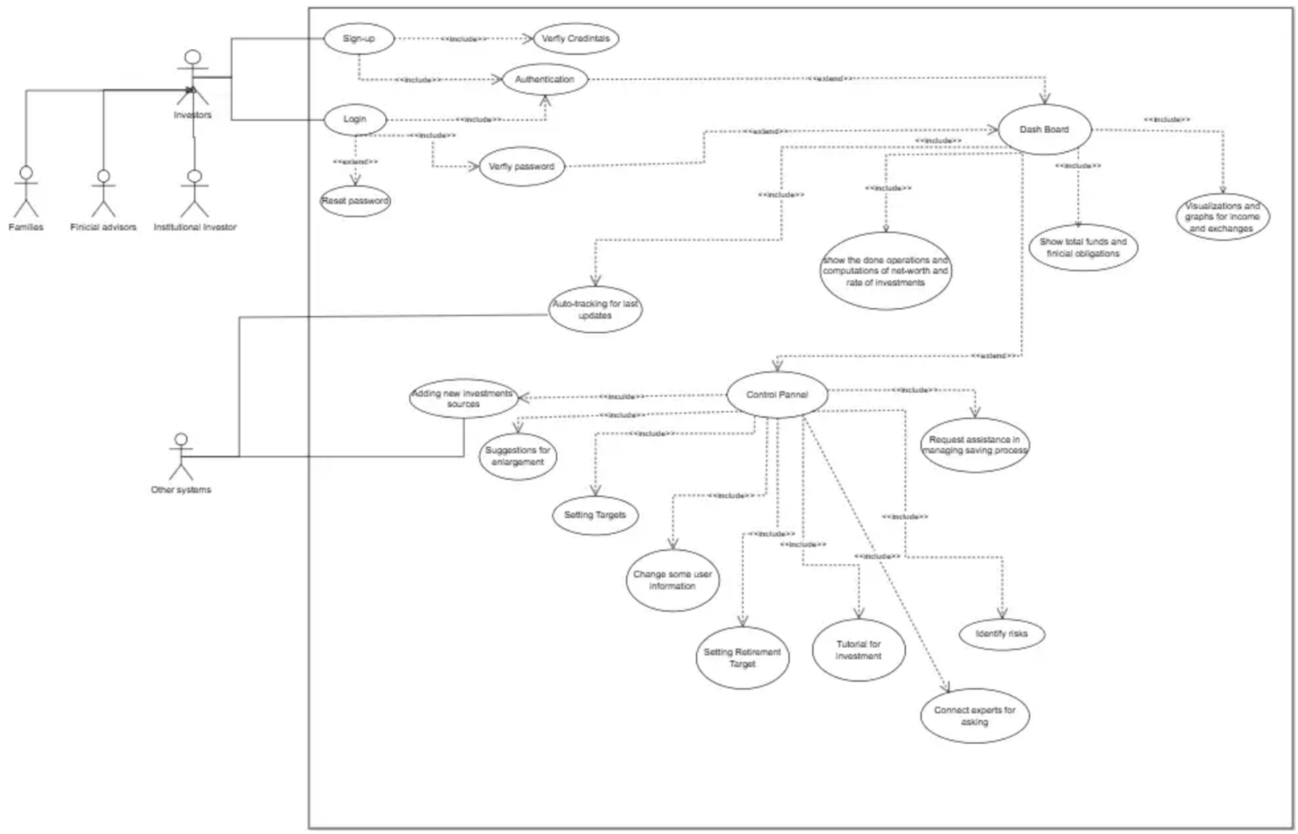
Software Requirements Specifications

	• The system must work seamlessly across mobile, tablets, and desktops, adapting to screen sizes dynamically.
Portability and compatibility	• The application should work on Windows, macOS, Linux, iOS, and Android without performance issues. • App should support for multiple payment methods • App should be multilingual, as it should be available in Arabic, English, and other regional languages.

Software Requirements Specifications

System Models

Use Case Model



- **Investor:** Represents users who invest in various financial instruments.
- **Financial advisors**: They use it as an assistant to their financial job to track their clients' portfolios.
- **Institutional Investor**: Companies, banks, or funds managing large investments.
- **Families :** Helps them to manage their multipurpose finances as financial educational part. Plans for major life events or manage risks
- **Other Systems:** External systems interacting with the investment system.

Software Requirements Specifications

Enriched User Stories

User Story #1

User Story ID	US #1
User Story Name	Signup for user
Actors	User
Description	**As** a User **I like** to be able to sign up to the application **So** I can login in and use the application
Per condition	
Post condition	National ID should not be duplicated with the data base
Acceptance Criteria	**Given** I'm a user and I'm on the login in page **When** I fill in the sign up information fields with my credentials and I click sign up **Then** the system signs me up

Normal Scenario

Actor Action	System Response
1- Click on sign up	
	2- System Show data that is required

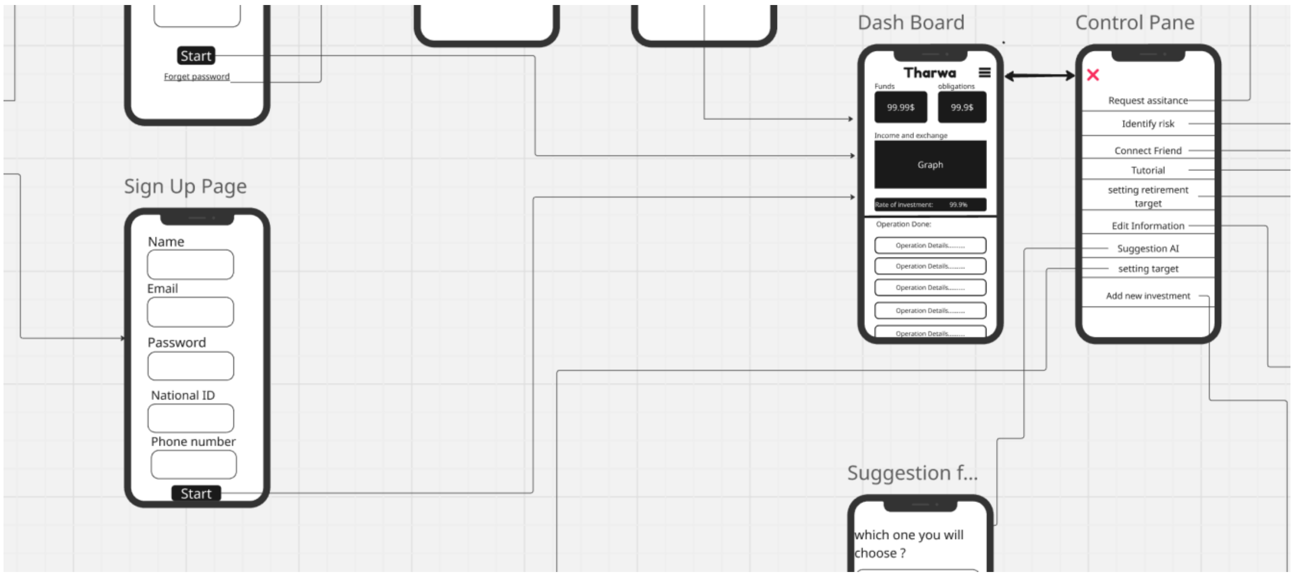
3- User Fill the input fields with data	
	4- System verify that this national id is not in system 6- Show the dashboard to the user

Exceptional Scenario

Actor Action	System Response
1- Click on sign up	
	2- Show the data should be entered
3- User fill the input fields with his data	
	4- system verify that national id is not in system 5- Show the user that this national id signed up before

Software Requirements Specifications

Screen Design



Data Dictionary

Element Label	Type/Length	Data Validation / Business Rule
Name field	Text < 100 character	Structured text
Email	Text < 100 character	Structured text
Password	Alphanumeric> 8 and < 20	Password confirmation and must include an uppercase letter, numbers and/or special characters
National ID	Numeric equal to 14 digits	Check it in the database of civil registry
Phone number field	Numeric < 15 digit	Confirmed by text message

Software Requirements Specifications

User Story #2

User Story ID	US #2
User Story Name	login for user
Actors	User
Description	As a User I like to be able to login to the application So I can see dashboard and use the application
Per condition	
Post condition	Email and password are correct
Acceptance Criteria	Given I'm a user and I am on the login in board When I fill in the login information fields with my email and password and I click sign up Then the system logins me in

Normal Scenario

Actor Action	System Response
1- Click on login in	
	2- System Show data that is required
3- User Fill the input fields with data	

	4- System verify that email and password are correct. 5- Show the dashboard to the user

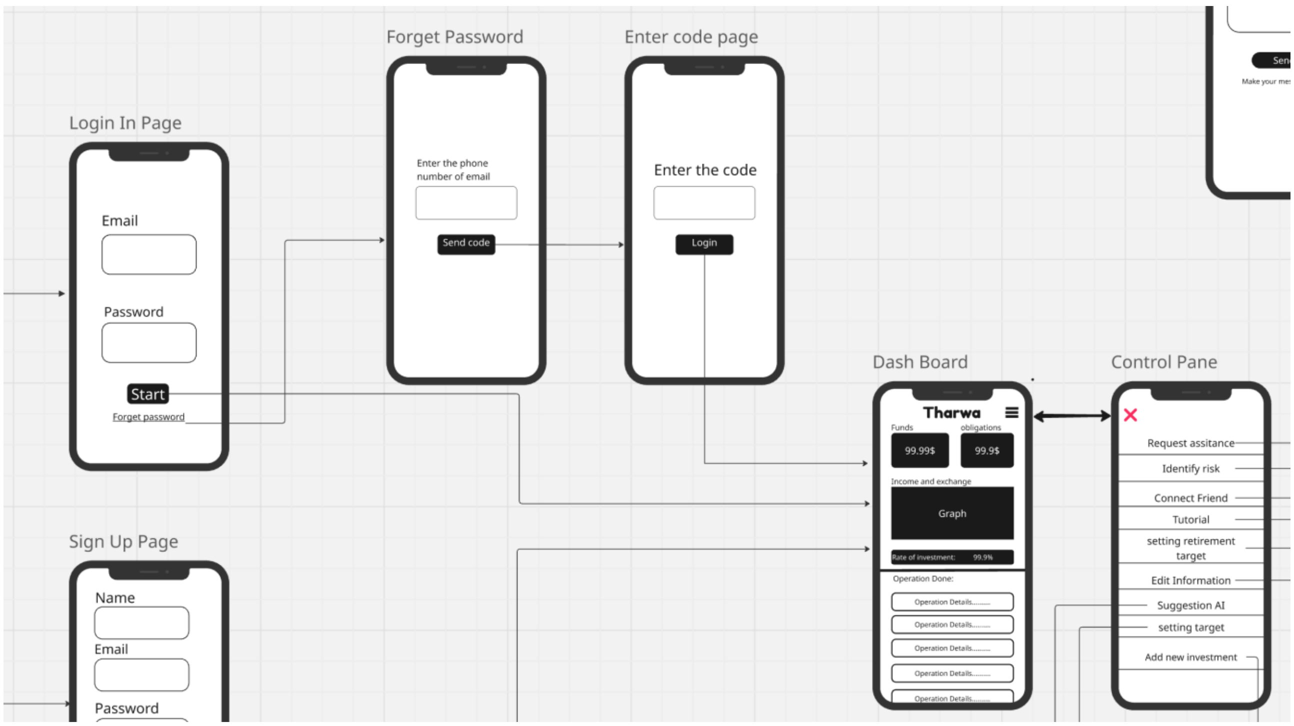
Exceptional Scenario

Actor Action	System Response
1- Click on login	
	2- Show the data should be entered
3- User fill the input fields with his data	
	4- system verify that email and password to be correct 5- Show the user that email or password is wrong and enter them again

CS251: Phase 1 Optimum
Project: **Tharwa**

Software Requirements Specifications

Screen Design



Data Dictionary

Element Label	Type/Length	Data Validation / Business Rule
Email	Text < 100 character	Structured text
Password	Alphanumeric> 8 and < 20	Password confirmation and must include an uppercase letter, numbers and/or special characters

User Story #3

User Story ID	US #3
User Story Name	Dashboard of user
Actors	User
Description	As a User I like to see done operation, computation of net-worth , rate of investment , total funds and financial obligation, visualization and graphs for income and exchange So I can login in and use the application
Per condition	Login or sign up is done
Post condition	
Acceptance Criteria	Given I'm a user and I'm on dashboard When I end the sign in or the login. Then the system shows me the done operation, computation of net-worth , rate of investment , total funds and financial obligation, visualization and graphs for income and exchange

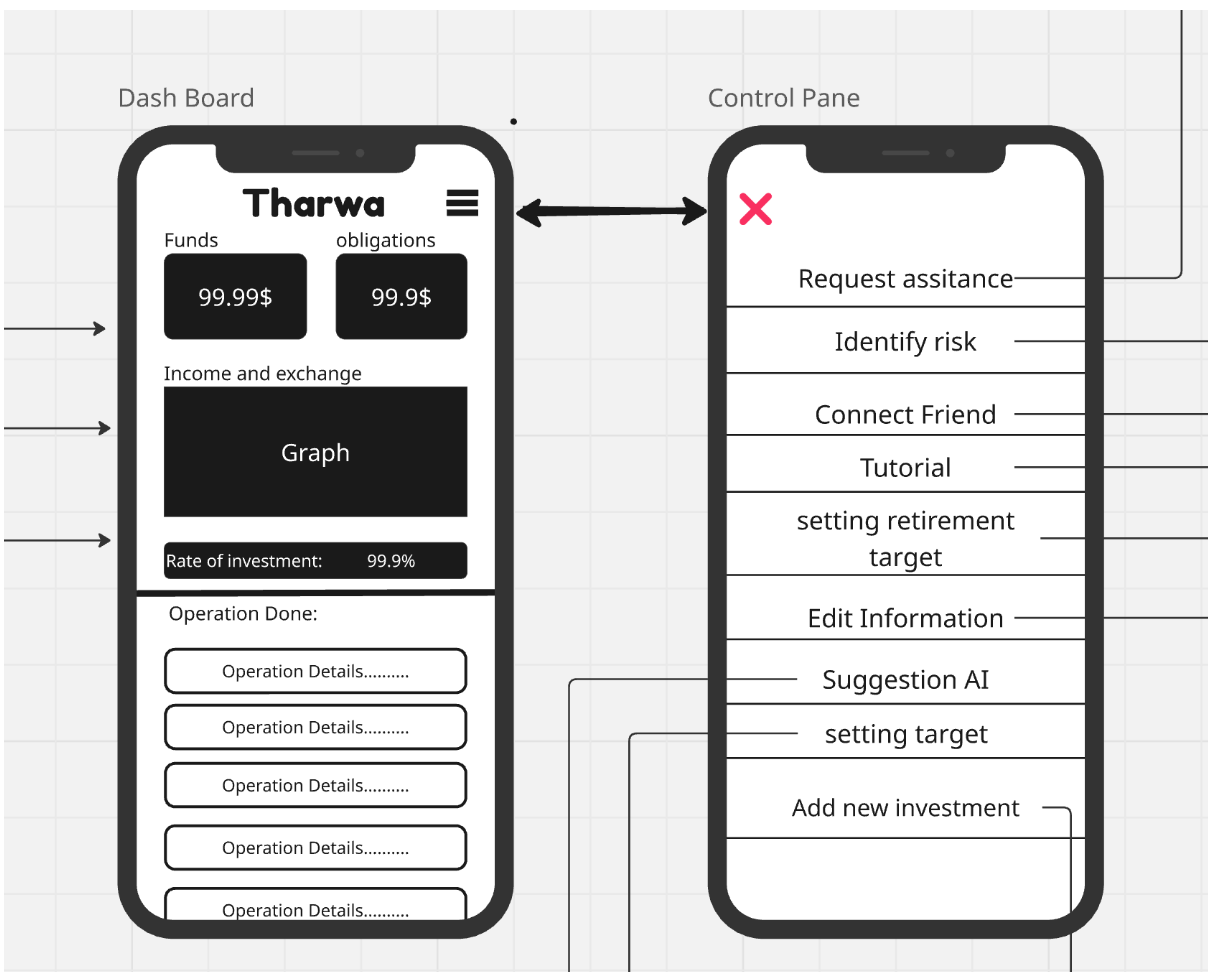
Normal Scenario

Actor Action	System Response
1- user open the dash board	
	2- Make the graph and visualize for income and exchange.

Software Requirements Specifications

	3- Show the visualization.
	4- Show total funds and financial obligation. 5- Show the done operation and computation of net-worth and rate of investment.
	6- Show the buttons that go to control panel and tracking for last updates

Screen Design



Software Requirements Specifications

User Story #4

User Story ID	US #4
User Story Name	Identify Risks
Actors	Investors
Description	As an Investor I like to identify the potential risks . So I will decrease the potential loss.
Per condition	
Post condition	
Acceptance Criteria	Given I am on the control panel and want to identify the risks When I clicked the button to identify the risks Then the system shows small list to choose which one I want to identify its potential risks.

Scenarios

Normal Scenario

Actor Action	System Response
1- User clicks the button of identifying potential risks.	

Software Requirements Specifications

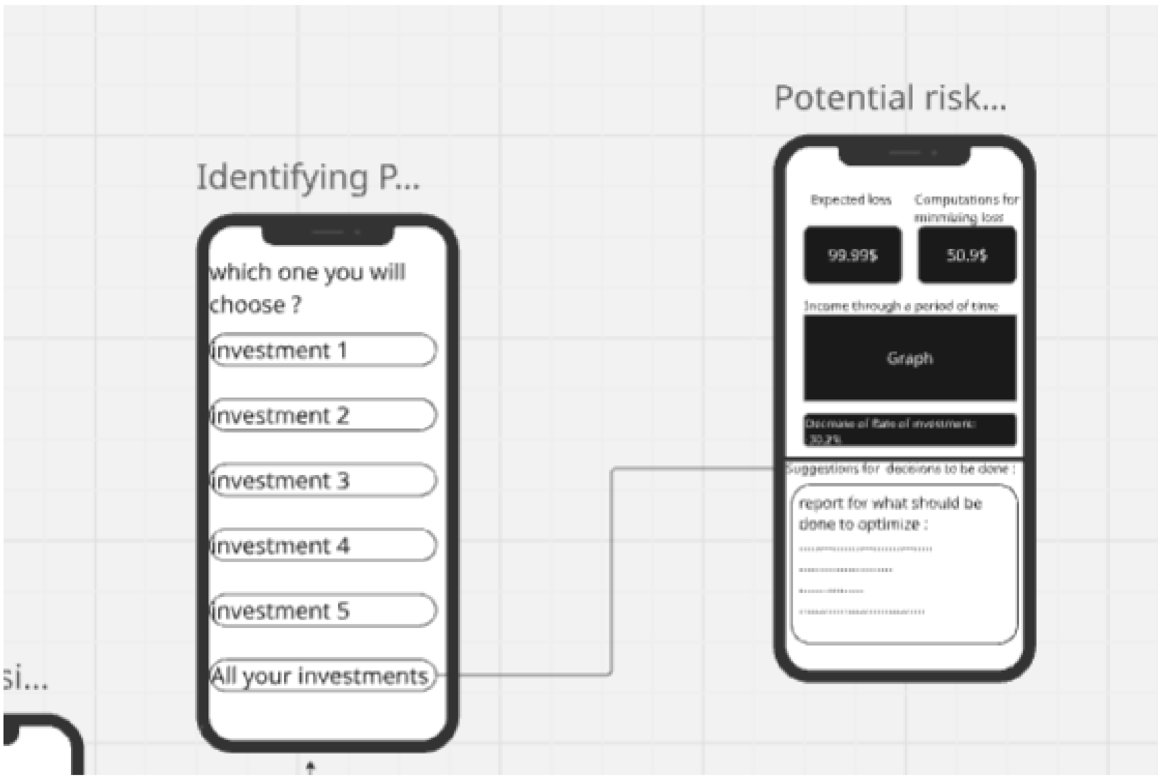
	2- System shows a small list of the investments or in general
3- the user chooses an option from the listed options	
	4- System shows some computations ,as expected loss ,computations for minimizing loss, and decrease of rate of investment, and predications associated with some graphs for identifying the potential risks. 5- then there is a report at the end showing what decisions and suggestions should be taken to optimize that loss

Exceptional Scenario

There is no exceptional scenario here

Software Requirements Specifications

Screen Design



Data Dictionary:

Element Label	Type/Length	Data Validation / Business Rule
Specified investment	Dropdown	No validation

Software Requirements Specifications

User Story #5

User Story ID	US #5
User Story Name	Adding new investment sources
Actors	Other systems and investor
Description	As an investor I like to be able to add new investment sources to connect it to my account So I will be able to increase my investments
Per condition	
Post condition	
Acceptance Criteria	Given I clicked on the button of adding new investment sources When I choose which investment type I will add to my account and the system redirects me to a form requires data to be filled about the added item and Then I fill in the required data of the investment source depending on the type of the added item with some verifications then The system after that will add it successfully .

Scenarios

Normal Scenario

Software Requirements Specifications

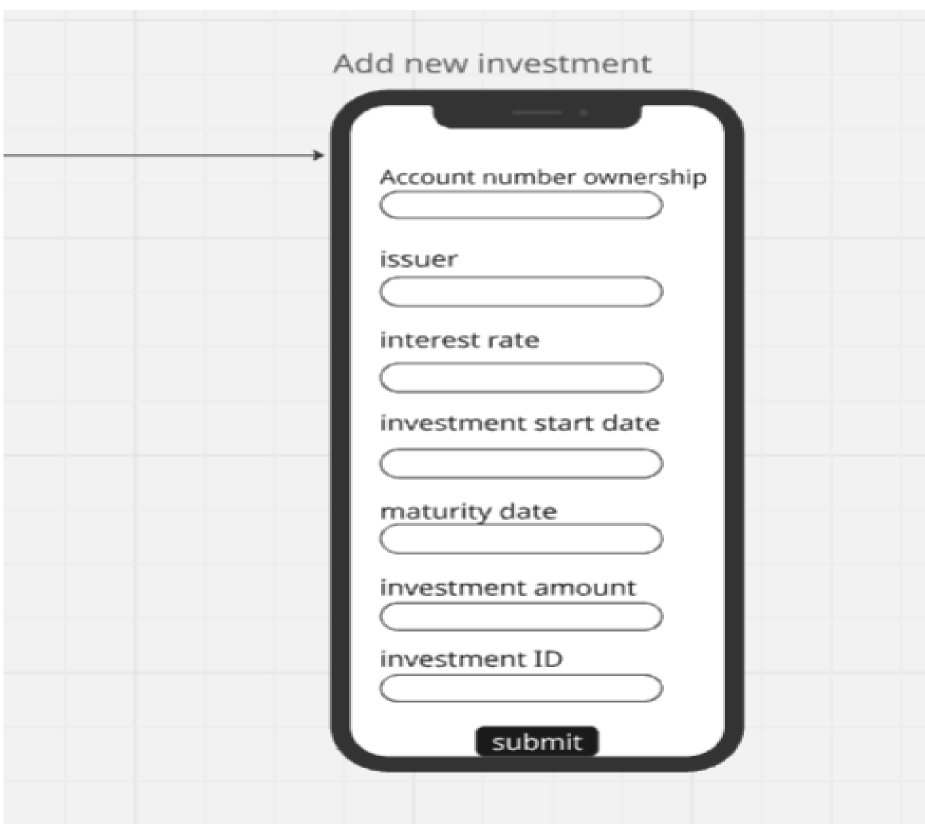
Actor Action	System Response
1- User chooses to add new investment source	
	2- System redirects to a small list to choose from it the type of the item
3- User Select one of them	
	4- the system shows a form to fill required data
5- user fills the required data fields 6- Click Submit	
	7- System makes the following processes: Verifying bank/other system account ownership with the bank /other system Ensuring product details match the bank's/other system's data with the bank /other system Applying security measures 8- The system redirects you to the control panel and adds your new item after verifications.

Software Requirements Specifications

Exceptional Scenario

Actor Action	System Response
User fills the required data fields Click Submit	
	3- The data do not match or some security tests failed . 4- System rejects the added item and displays the operation is denied.

Screen Design



Software Requirements Specifications

Data Dictionary:

Element Label	Type/Length	Data Validation / Business Rule
Linked bank/other system account number ownership	Text<16	Validating that account exists or active in the bank/other system or not
Issuer	Dropdown	Validation that should be filled
Interest rate	Integer<30	Validation for the limits and integer
Investment Start Date	Date <15 characters	DD/MM/YY format
Maturity Date	Date <15 characters	DD/MM/YY format
Investment Amount	1<Integer	Validation for non-negative integers
Investment ID	Text <20 characters	Validation for existence and its status

Software Requirements Specifications

User Story #6

User Story ID	US #6
User Story Name	Suggestion for enlargement
Actors	Investor
Description	As an investor I like to be able to have some suggestions for enlargement So that will help me to take decisions
Per condition	
Post condition	
Acceptance Criteria	Given I want to have some suggestions When I clicked the button for suggesting for enlargements Then the system shows me a list for which investment I need suggestions for.

Scenarios

Normal Scenario

Actor Action	System Response
user chooses the option suggestions for enlarging the investment	

Software Requirements Specifications

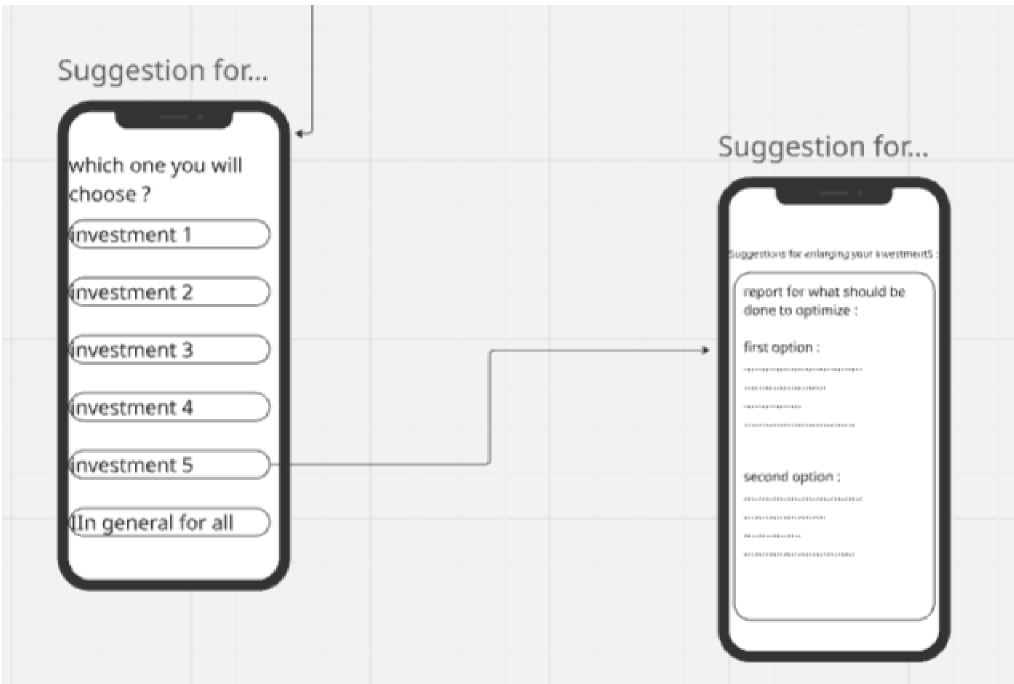
	2- System shows a list to choose which one of your investments you want suggestion for or for general
3- User Select from the list whether something specific or in general	
	4- System gives some suggestions for the chosen one 5-Asking for implementation that and track it or not
6- The user answers the question whether to implement it and track it or not	

Exceptional Scenario

There is no Exceptional Scenario

Software Requirements Specifications

Screen Design



Data Dictionary:

Element Label	Type/Length	Data Validation / Business Rule
Specified investment or general	Dropdown	No validation
Answer for yes or no	Radio button	No validation

Software Requirements Specifications

User Story #7

User Story ID	US #7
User Story Name	Setting target
Actors	Investor
Description	As an investor I like to be able to set a target for my investments So that will help me as reminder for achieving that target
Per condition	
Post condition	
Acceptance Criteria	Given I want to set a target When I clicked the button for setting a target Then the system shows me a list for which investment I need to set a target for.

Scenarios

Normal Scenario

Actor Action	System Response
1- user chooses the option to set a target	

	2- System shows a list to choose which one of your investments you want to set a target for or for general
3- User Select from the list whether something specific or in general	
	4- System shows a form to fill it
5- The user fills the required fields 6- clicks submit	7- The system adds it to the targets

Exceptional Scenario

Actor Action	System Response
User fills the required data fields Click Submit	
	3- Verify for the logic of the data in case of wrong , system prompts an error message.

Software Requirements Specifications

Screen Design

Data Dictionary:

Element Label	Type/Length	Data Validation / Business Rule
Specified investment or general	Dropdown	No validation
financial percent target to reach	0.5<Integer<100	Validate to be in the range of the percentage
the start time of the target	Date<15 characters	DD/MM/YY format
the end point of the target	Date<15 characters	DD/MM/YY format

Software Requirements Specifications

User Story #8

User Story ID	US #8
User Story Name	change some user information
Actors	User/investor
Description	As an investor I'd like to be able to edit my personal info So I can keep my details up to date in case of any changes or mistakes
Per condition	
Post condition	
Acceptance Criteria	Given I am a signed-in (registered) user and I am on the control panel When I click on the edit option, select the information to update, and submit the changes Then the system successfully saves my updated information and provides confirmation

Scenarios

Normal Scenario

Actor Action	System Response
1- user clicks to edit	
	2- system verifies user is registered 3- System displays user information
4- User makes changes then submits	

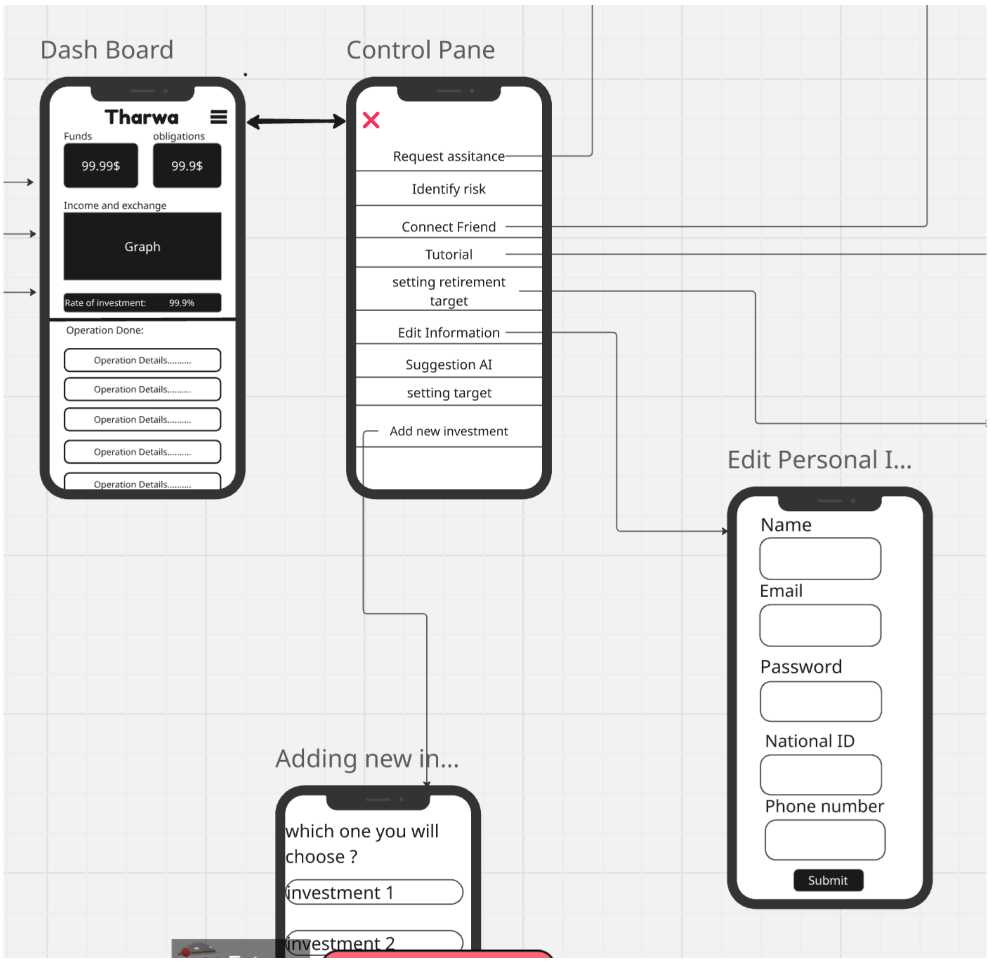
	5- System validates input and saves changes 6- System confirms the update with a success message

Exceptional Scenario

Actor Action	System Response
1- user clicks to edit	
	2- system verifies user is registered 3- System displays user information
4- User enters invalid data (e.g., wrong email format)	
	5- System notifies the user that the update failed and suggests retrying later

Software Requirements Specifications

Screen Design



Data Dictionary:

Element Label	Type/Length	Data Validation / Business Rule
Name field	Text < 100 character	Structured text
Email	Text < 100 character	Structured text

Software Requirements Specifications

Element Label	Type/Length	Data Validation / Business Rule
Password	Alphanumeric> 8 and < 20	Password confirmation and must include an uppercase letter, numbers and/or special characters
National ID	Numeric equal to 14 digits	Check it in the database of civil registry
Phone number field	Numeric < 15 digit	Confirmed by text message

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User Story #9

User Story ID	US #9
User Story Name	setting retirement target
Actors	User/investor
Description	As an investor I'd like to set my retirement target So I can plan my savings and financial goals
Per condition	
Post condition	
Acceptance Criteria	Given I am a registered and logged-in user on the retirement planning page When I enter my retirement target (age, savings goal, expected expenses, etc.) and submit it Then the system should save my target and confirm the update.

Scenarios

Normal Scenario

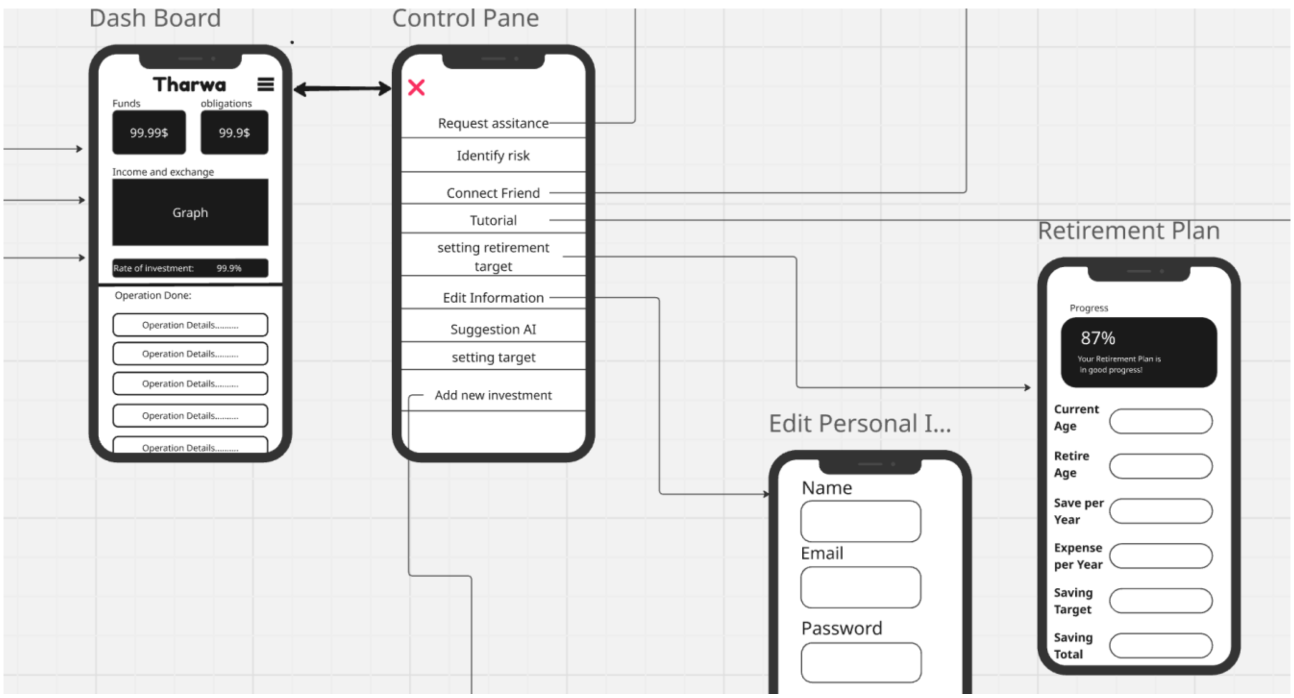
Actor Action	System Response
1- User navigates to the retirement planning section.	
	2- System loads the retirement planning interface
3- User enters the retirement target details (age, savings goal, etc.).	
	5- System validates the input. 6- System saves the retirement target and displays a success message.

Exceptional Scenario

Actor Action	System Response
1- User enters an invalid target (e.g., negative age, unrealistic savings goal).	
	2- System displays an error message and asks for a valid input.

Software Requirements Specifications

Screen Design



Software Requirements Specifications

Data Dictionary:

Element Label	Type/Length	Data Validation / Business Rule
Save per year	0<Integer	Validate to be in the range of the percentage
Expense per year	0<Integer	Validate to be in the range of the percentage
Saving total	0<Integer	Validate to be in the range of the percentage
Saving target	0<Integer	Validate to be in the range of the percentage
Current Age	18<Integer<100	Validate to be in the range of the percentage
Retire Age	18<Integer<100	Validate to be in the range of the percentage

Software Requirements Specifications

User Story #10

User Story ID	US #10
User Story Name	request assistance in managing saving resources
Actors	User/investor
Description	As an investor I'd like to request assistance in managing saving resources So I can enhance my investment and budgeting skills and achieve my financial goals effectively
Per condition	
Post condition	
Acceptance Criteria	Given I am a signed-in (registered) user and I am on the control panel When I request assistance by submitting my financial details and preferences, Then the system should either provide automated saving strategies or connect me with a financial advisor for personalized guidance.

scenarios

Normal Scenario

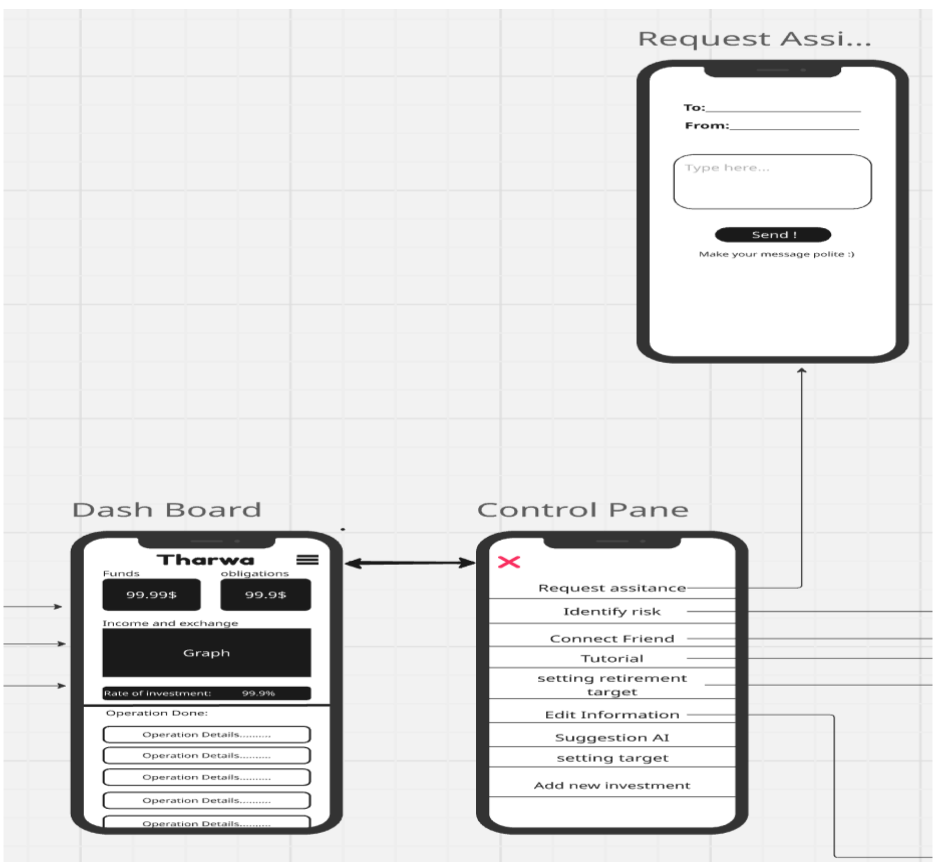
Actor Action	System Response
1- user clicks to request assistance in managing saving resources 2- User selects "Request Assistance" and enters financial details (income, expenses, savings goal, etc.).	

	3- System processes the request and provides automated recommendations OR assigns a financial advisor. 4- System confirms the assistance request and updates the user's dashboard.

Exceptional Scenario

No exceptional scenario for this case.

Screen Design



Software Requirements Specifications

Data Dictionary:

Element Label	Type/Length	Data Validation / Business Rule
To	Text < 100 character	Structured text
From	Text < 100 character	Structured text
message	0<Text < 1000 character	Structured text & In range

User Story #11

User Story ID	US #11
User Story Name	tutorial for investment
Actors	User/investor & System (Investment Learning Module)
Description	As an investor I'd like to access a tutorial for investment So I can learn how to make informed investment decisions and manage my financial resources effectively
Per condition	
Post condition	
Acceptance Criteria	Given I am a signed-in (registered) user and I am on the control panel When access the investment tutorial section Then the system should provide structured learning materials, videos, and quizzes to guide me through the investment process.

Software Requirements Specifications

Scenarios

Normal Scenario

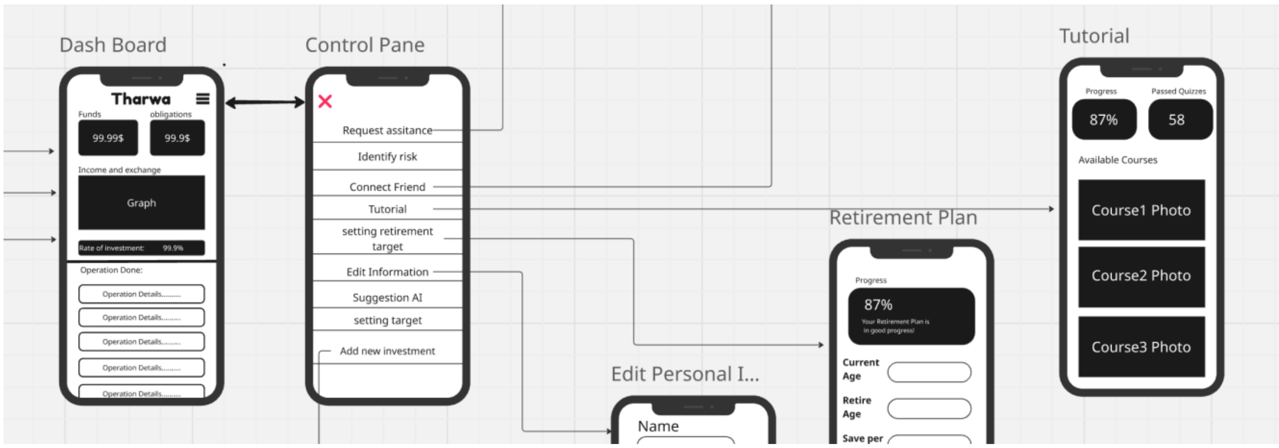
Actor Action	System Response
1- User navigates to the investment tutorial section.	
	2- System loads available tutorials and learning resources.
3- User selects a tutorial to begin.	
	4- System starts the tutorial with interactive lessons, videos, and explanations.
5- User progresses through the tutorial.	
	6- System tracks progress and allows resumption from the last completed section

Exceptional Scenario

No exceptional scenario for this case.

Screen Design

Software Requirements Specifications



Data Dictionary:

Element Label	Type/Length	Data Validation / Business Rule
Progress	0<Integer<100	Validate to be in the range of the percentage
Passed Quizzes	0<Integer	Validate to be in the range of the percentage

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User Story #12

User Story ID	US #12
User Story Name	Connect friends for asking questions
Actors	Investor
Description	As an investor I'd like to connect to friends to ask questions

Software Requirements Specifications

	So I can gain experience and connect people
Per condition	
Post condition	
Acceptance Criteria	Given I am a signed-in (registered) user and I am on the control panel When I click on someone profile's to connect and ask Then the system successfully connects me to that friend

Scenarios

Normal Scenario

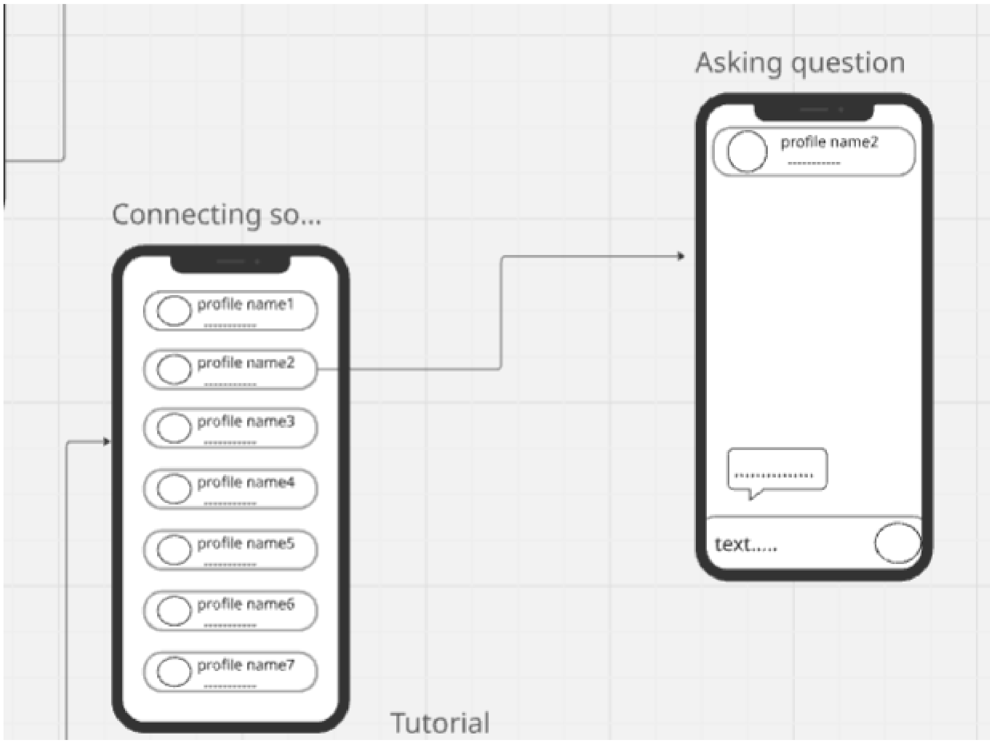
Actor Action	System Response
1- user clicks to connect someone to ask a question	
	2- system enables him to connect that person
3- user sends his question	
	4- system sends the message successfully to his friend

Exceptional Scenario

No exceptional scenario for this case.

Screen Design

Software Requirements Specifications

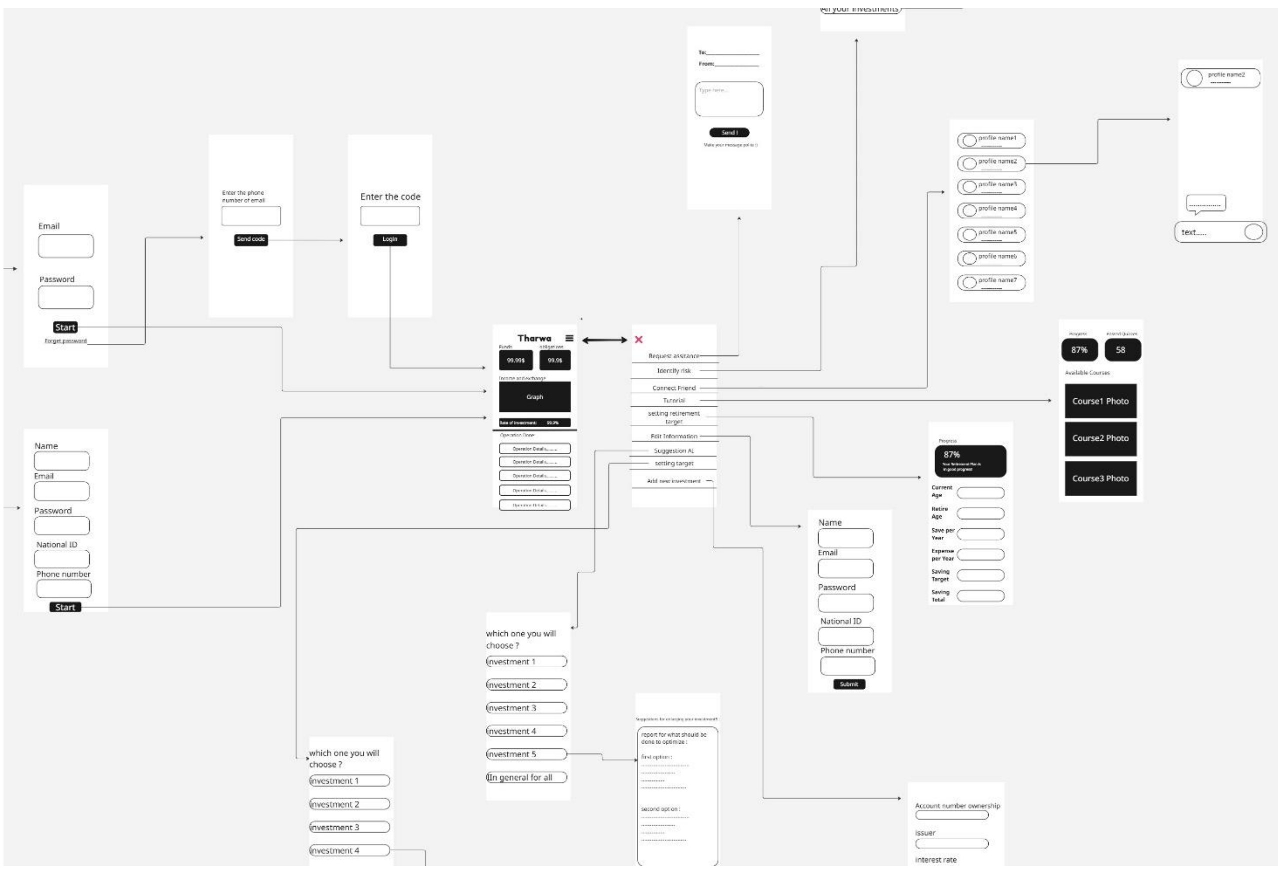


Data Dictionary:

Element Label	Type/Length	Data Validation / Business Rule
message	Text	No validation

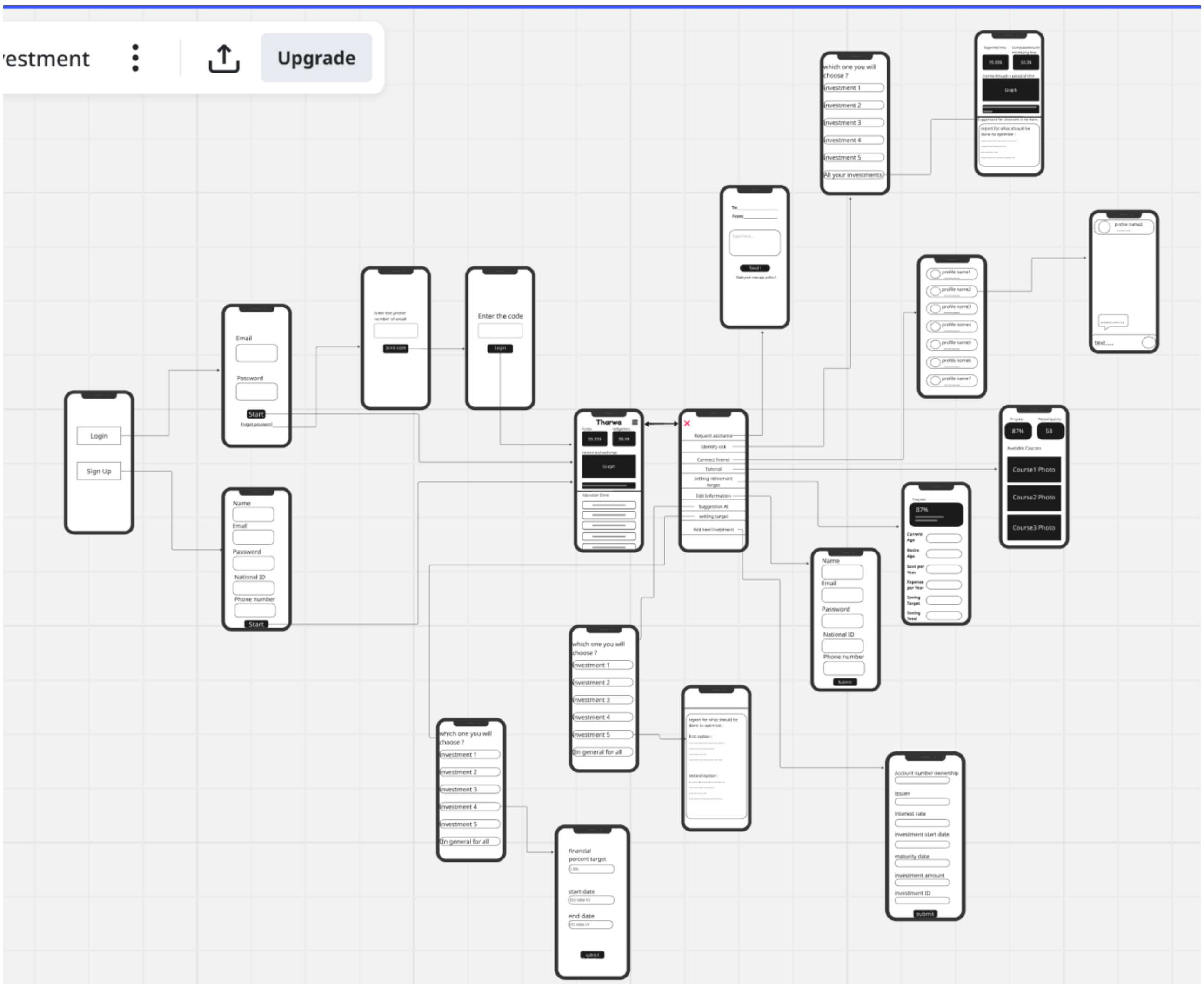
Software Requirements Specifications

System Navigation Map



CS251: Phase 1 Optimum
Project: **Tharwa**

Software Requirements Specifications



The Tool used in this:

- Draw.io
- Miro

Ownership Report

Software Requirements Specifications

Student	Items he created
Aly EL-Deen Yasser	Use Case diagram, use case scenario 1,2 and 3 ,non-functional requirement and system navigation for 1,2,3.
Nagham Wael Mohamed	Document Audience & Purpose, Software Purpose, Software Definitions, Software Scope, use case scenario 8,9,10,11 and 12, Presentation slides and system navigation for 8,9,10,11
Fatema El-Zhraa Ahmed	Use Case Diagram, use case scenario 4,5,6,7 and 12, Functional Requirement and system navigation for 4,5,6,7 and 12.