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SYSTEM REQUIREMENTS SPECIFICATIONS

GAMIFIED FINANCIAL VISUALIZER

For

Demo 1

Presented by :

CodeBlooded

MENU

Introduction

This System Requirements Specification (SRS) outlines the structure and behaviour of the Gamified Financial Visualizer, a cross-platform application designed to promote financial literacy through gamification, AI-powered insights, and augmented reality. The system enables users to manage their finances in an engaging and educational environment.

The purpose of this document is to define the system's functional and non-functional requirements, providing a shared reference for stakeholders, including developers, testers, and academic supervisors. It ensures a clear understanding of the system's objectives, scope, and constraints.

Included in this SRS are:
- Business Needs and Project Scope
- User Characteristics and User Stories
- Functional Requirements and Use Cases
- System Requirements (functional and non-functional)
- Traceability Matrix

This document will support the system's development lifecycle and evolve as the project progresses.
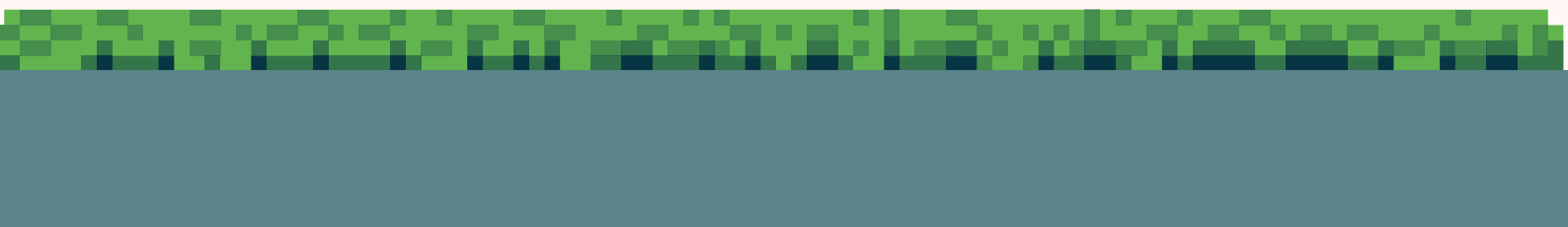
Business Needs

The Gamified Financial Visualizer addresses a growing need for accessible, engaging, and educational financial tools, particularly among younger users and students with limited financial literacy. Traditional finance apps often lack interactivity, personalization, and user motivation, which leads to disengagement and poor financial habits.

This project aims to solve that by integrating gamification, augmented reality (AR), and artificial intelligence (AI) into a single platform that transforms how users interact with their financial data.

The key business needs driving the system are:

Financial Literacy Promotion
To help users build strong financial habits by making financial education engaging, interactive, and rewarding.

User Engagement & Retention
To motivate continued use through gamified elements, AR visualizations, and reward-based learning, increasing user retention and satisfaction.

Personalized Financial Insights
To provide users with AI-driven, tailored financial feedback and suggestions based on their transaction data and goals.

Cross-Platform Accessibility
To support both mobile and web platforms, ensuring users can manage and visualize their finances anytime, anywhere.

Security & Trust
To ensure user confidence through strong data protection, privacy practices, and compliance with legal standards (e.g., GDPR, POPIA).

By meeting these needs, the system supports its core objective: to transform financial management into an engaging, educational, and user-friendly experience.
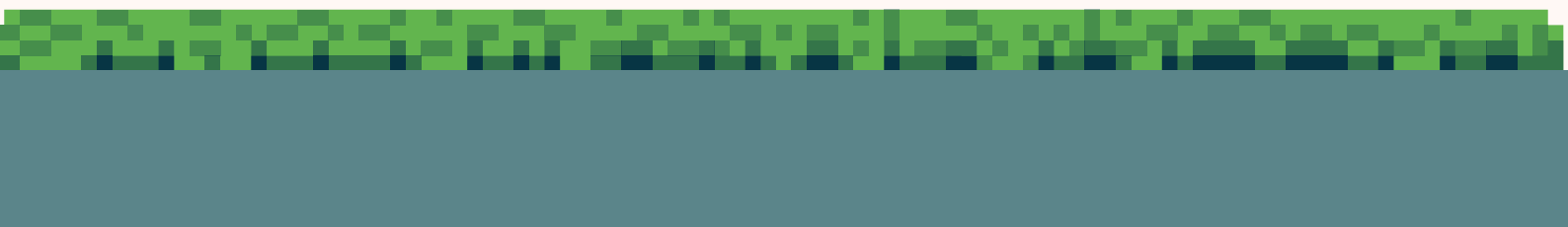
Project Scope

The Gamified Financial Visualizer is a cross-platform application designed to improve financial literacy and management through interactive visualizations, gamified learning, and AI-driven financial insights. This project focuses on developing a functional platform that demonstrates core features while remaining feasible within academic timelines and technical constraints.

In Scope:

Financial Data Visualization
Users can view and interact with their financial data through dashboards, 3D charts, and AR scenes.

Transaction Categorization
 AI models (e.g., DistilBERT) will classify and label transactions based on user input and historical data.

Personalized Financial Advice
Users receive context-aware tips, budgeting suggestions, and progress tracking from a local AI assistant.

Gamified Learning Modules
Educational content is delivered in a quiz-based, point-earning format to encourage consistent financial learning.

Augmented Reality Features
Users can visualize their financial goals, progress, and insights using AR experiences powered by Unity.

Cross-Platform Support
The application will run on mobile (React Native) and web (React.js), with shared components for consistent behavior.

Secure Authentication and Privacy Controls
Implementation of secure login, encryption, and data anonymization to comply with privacy regulations.

User Characteristics

User Type	Description
Registered User	Authenticated users with access to all features including tracking, visualization, education, and community.
Gamification-Oriented User	Users who are motivated by points, badges, and dynamic AR-based financial visualizations.
Financial Learner	Users who engage with the educational modules and AI assistant to enhance their financial literacy.

User Stories

User Management

1. **As a new user**, I want to register using my email, full name, and username so that I can access the platform.
   a. Acceptance Criteria:
      i. Given I am on the registration page, when I enter valid details, then my account should be created.

2. **As a user**, I want to log in securely using my username and password so that I can access my account.
   a. Acceptance Criteria:
      i. Given I have an account, when I enter correct credentials, then I should be granted access.

3. **As a user**, I want to recover my password via email so that I can regain access to my account.
   a. Acceptance Criteria:
      i. Given I click 'forgot password', when I submit my email, then I should receive a recovery link.

1. **As a user**, I want to enable 2FA so that my account has an extra layer of security.
   a. Acceptance Criteria:
      i. Given I have enabled 2FA, when I log in, then I should be prompted for a code sent to my email.

2. **As a user**, I want to add personal information so that AI responses are tailored to me.
   a. Acceptance Criteria:
      i. Given I access my profile, when I add financial info, then AI should use this for suggestions.

Financial Asset Visualization (AR)

1. **As a user**, I want to view my financial data as virtual assets in AR so that I can understand my finances visually.
   a. Acceptance Criteria:
      i. Given I launch AR view, when financial data is loaded, then I should see it as virtual assets.

2. **As a user**, I want my AR assets to update in real-time so that changes reflect immediately.
   a. Acceptance Criteria:

        i .Given I input a new transaction, when the AR view is active, then the visual should update instantly.

3. **As a user**, I want to compare 3D and AR views so that I can understand financial data from multiple perspectives.
    a. Acceptance Criteria:
        i. Given I switch views, when I toggle from 3D to AR, then the same data should be shown in both.

Expense and Income Tracking

1. **As a user**, I want the system to auto-classify transactions from my bank statements so that I don't have to do it manually.
    a. Acceptance Criteria:
        i. Given I upload a PDF, when the AI processes it, then my expenses are categorized automatically.
2. **As a user**, I want to manually input and categorize transactions so I can track them independently.
    a. Acceptance Criteria:
        i. Given I open the form, when I input data, then it should be saved and categorized.
3. **As a user**, I want to edit or delete transactions so that I can maintain accurate records.
    a. Acceptance Criteria:
        i. Given I view a transaction, when I click edit/delete, then changes should reflect in my records.
4. **As a user**, I want the system to remind me to log transactions, so I stay consistent.
    a. Acceptance Criteria:
        i. Given reminders are enabled, when a period of time passes without logging, then I receive a notification.
5. **As a user**, I want to define my own categories so that I can organize finances in my way.
    a. Acceptance Criteria:
        i. Given I access category settings, when I create a new one, then it appears in my options.

6. **As a user,** I want to track recurring transactions like debit orders so that I don't miss them.
    a. Acceptance Criteria:
        i. Given a recurring item exists, when the date hits, then it should be added to my records.
7. **As a user,** I want to create manual accounts so I can simulate offline assets.
    a. Acceptance Criteria:
        i. Given I open account creation, when I input data, then it appears in my list of accounts.
8. **As a user**, I want a dashboard to visualize my finances so I can understand trends and breakdowns.
    a. Acceptance Criteria:
        i. Given I access the dashboard, when I have data logged, then graphs and summaries are shown.
9. **As a user**, I want my spending to be analysed and scored so I can improve my financial behaviour.
    a. Acceptance Criteria:
        i. Given I log new expenses, when AI runs analysis, then a score is shown in my dashboard.
10. **As a user**, I want to search for transactions using keywords or prompts so I can find them quickly.
    a. Acceptance Criteria:
        i. Given I enter a search query, when results match, then they are displayed.

Educational Modules
1. **As a user**, I want to view educational modules so I can improve financial literacy.
    a. Acceptance Criteria:
        i. Given I am on the education dashboard, when I click a module, then it opens with its content.
2. **As a user**, I want to get AI-based financial advice so I can learn from intelligent feedback.
    a. Acceptance Criteria:

i. Given I type a question, when I click submit, then I get a personalized answer.

7. **As a user**, I want to earn rewards for completing quizzes, so I stay motivated.
   a. Acceptance Criteria:
      i. Given I complete a module and pass the quiz, then I earn points and feedback.

Goal Management

1. **As a user**, I want to create savings goals so I can track toward big purchases.
   a. Acceptance Criteria:
      i. Given I fill out the goal form, when I click save, then the goal is tracked.
2. **As a user**, I want to see visual progress toward my goals, so I stay motivated.
   a. Acceptance Criteria:
      i. Given I log progress, when I view the goal, then a visual bar updates accordingly.
3. **As a user,** I want notifications for approaching or completed goals, so I don't miss them.
   a. Acceptance Criteria:
      i. Given progress is 90% or 100%, when I open the app, then a message or popup appears.
4. **As a user**, I want AI to suggest savings tips so I can reach goals faster.
   a. Acceptance Criteria:
      i. Given AI sees overspending, when it runs analysis, then it provides recommendations.
5. **As a user**, I want to invite friends to shared goals so we can save together.
   a. Acceptance Criteria:
      i. Given I click 'Invite to Goal', when my friends accept, then our progress is pooled.

6. **As a user**, I want to earn tier points for achieving goals so I can unlock tier rewards.
   a. Acceptance Criteria:
      i. Given I hit a target, when the goal completes, then points are added to my profile.
7. **As a user**, I will lose tier points for withdrawing funds from a goal, so I stay accountable.
   a. Acceptance Criteria:
      i. Given I remove funds, when I confirm, then my tier points are penalized.

Community Interaction

1. **As a user**, I want to find and add friends by username so I can build my network.
   a. Acceptance Criteria:
      i. Given I search a username, when results show, then I can send an invite.
2. **As a user**, I want to compare my financial data with friends so I can learn and grow.
   a. Acceptance Criteria:
      i. Given I select a friend, when I click 'Compare', then a side-by-side chart is shown.
3. **As a user**, I want to join savings challenges, so I stay consistent through competition.
   a. Acceptance Criteria:
      i. Given I start or join a challenge, when I make progress, then it reflects in real-time.
4. **As a user**, I want to share achievements so I can celebrate progress.
   a. Acceptance Criteria:
      i. Given I complete a milestone, when I click 'Share', then a visual badge is generated.
5. **As a user**, I want to see a leaderboard so I can track how I rank among peers.

      a. Acceptance Criteria:
           i. Given I open the leaderboard, when it's loaded, then I see my score and friends' scores.

6. **As a user,** I want my friends to get notified when I achieve goals, so I get recognition.
      a. Acceptance Criteria:
           i. Given I complete a milestone, when it's logged, then friends are notified.

Personalization

1. **As a user**, I want to personalize my AR world, so it reflects my preferences.
      a. Acceptance Criteria:
           i. Given I have enough points, when I unlock a skin, then it is applied to my AR interface.

2. **As a user**, I want to set notification and AI preferences, so the system adapts to my needs.
      a. Acceptance Criteria:
           i. Given I access settings, when I change preferences, then they are saved and used.

Functional Requirements

R1. User Management (Subsystem: Authentication & User Profile)

R1.1. User Registration and Login
- R1.1.1. Users shall register using their email, full name, and a chosen username.
- R1.1.2. Users shall securely log in using a username and password.
- R1.1.3. The system shall validate login credentials against securely stored hashes.

R1.2. Account Security
- R1.2.1. The system shall support two-factor authentication via email.
- R1.2.2. The system shall allow password recovery via email verification.

R1.3. Profile Management
- R1.3.1. Users shall be able to update personal information for personalization.
- R1.3.2. The system shall allow users to delete their account.

R2. Financial Asset Visualization (Subsystem: AR Visualization Engine)

R2.1. Augmented Reality Financial Worlds
- R2.1.1. The system shall render an AR environment showing virtual financial assets based on financial activity.
- R2.1.2. Users shall view these assets in weekly or monthly ranges.
- R2.1.3. Assets shall update in real-time with new data inputs.

R2.2. Comparative Visuals
- R2.2.1. A 3D interface shall visualize expense/income data alongside AR elements.

R2.2.2. The system shall highlight financial growth and risk areas visually.

R3. Expense and Income Tracking (Subsystem: Finance Manager + AI Classification)

R3.1. Automatic Classification with AI
- R3.1.1. Users shall upload bank statement PDFs for automatic categorization.
- R3.1.2. The AI shall classify transactions by type.

R3.2. Manual Financial Entry
- R3.2.1. Users shall manually input incomes and expenses.
- R3.2.2. Users shall edit or delete entries post submission.
- R3.2.3. Users shall define custom categories and associate transactions.

R3.3. Habit & Reminder Features
- R3.3.1. The system shall send reminders to log transactions.
- R3.3.2. The system shall support recurring entries for debit orders and interest.

R3.4. Financial Budgeting
- R3.4.1. Users will be able to create budgets on transactions categories.
- R3.4.2. The system shall notify the user when they maximise their budget.

R3.4. Dashboards & Analytics
- R3.4.1. An interactive dashboard shall display graphs for categories, dates, etc.
- R3.4.2. Users shall view point scores representing financial health and gamified performance.
- R3.4.3. AI shall analyze habits and provide scoring insights.
- R3.4.4. Users shall search transactions using keywords or filters via LLM support.

R4. Community Interaction (Subsystem: Social Layer)

R4.1. Social Features
- R4.1.1. Users shall invite friends using usernames.
- R4.1.2. Users shall compare spending and gamified progress with others.
- R4.1.3. The system shall support leaderboards.
- R4.1.4. Friends shall receive notifications when a user earns rewards.

R4.2. Gamified Social Engagement
- R4.2.1. The system shall facilitate challenges.
- R4.2.2. Users shall share achievements externally (image-based sharing).

R5. Goal Managements (Subsystem: Financial Goal Engine)

R5.1. Goal Creation & Progression
- R5.1.1. Users shall set goals with target dates.
- R5.1.2. The system shall track and visualize goal progress.
- R5.1.3. Notifications shall alert users near goal deadlines or completion.

R5.2. AI-Based Assistance
- R5.2.1. AI shall recommend steps based on income/expenses to reach goals.
- R5.2.2. Users can invite friends to shared goals and monitor progress.

R5.3. Gamified Reinforcement
- R5.3.1. On success, users earn tier points reflected in AR.
- R5.3.2. On failure, users lose points and AR assets downgrade accordingly.

R6. Educational Modules (Subsystem: Learning Engine)

R6.1. Financial Literacy Pathways

- R6.1.1. The system shall provide text-based roadmaps and quizzes.
- R6.1.2. Modules shall be grouped into topics.

R6.2. AI-Powered Assistance

- R6.2.1. Users shall interact with an AI financial assistant for guidance.
- R6.2.2. The assistant shall recommend learning modules based on user profile.

R6.3. Rewards & Incentives

- R6.3.1. Users shall earn points upon successful quiz completion.
- R6.3.2. Rewards can be used to unlock AR features.

R7. Personalization (Subsystem: Settings & Customization)

R7.1. AR Environment Customization

- R7.1.1. Users shall customize their AR world.
- R7.1.2. Skins and themes shall be unlocked using in-game points.
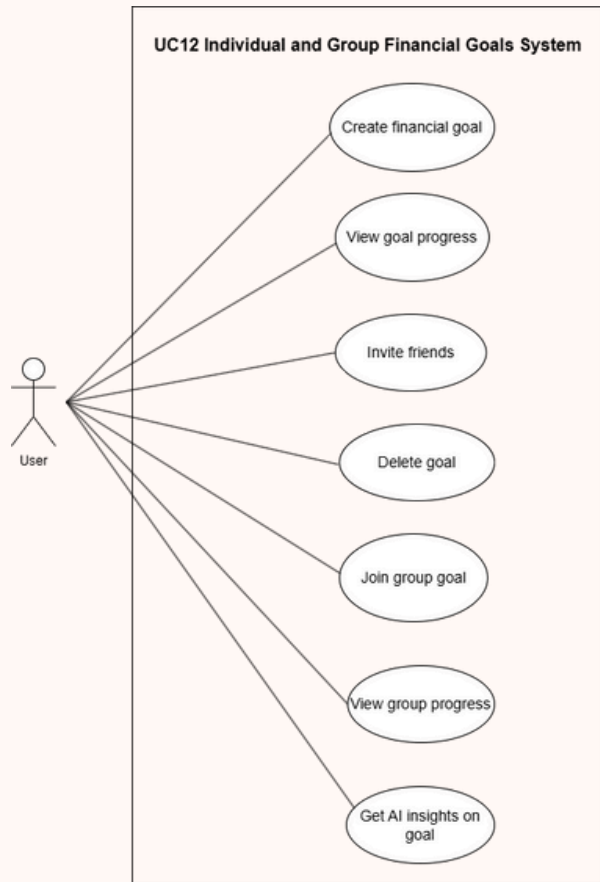
R7.2. Notification Preferences

- R7.2.1. Users shall set notification types (reminders, milestones, challenges).
- R7.2.2. Users shall adjust frequency and delivery method (in-app, email).
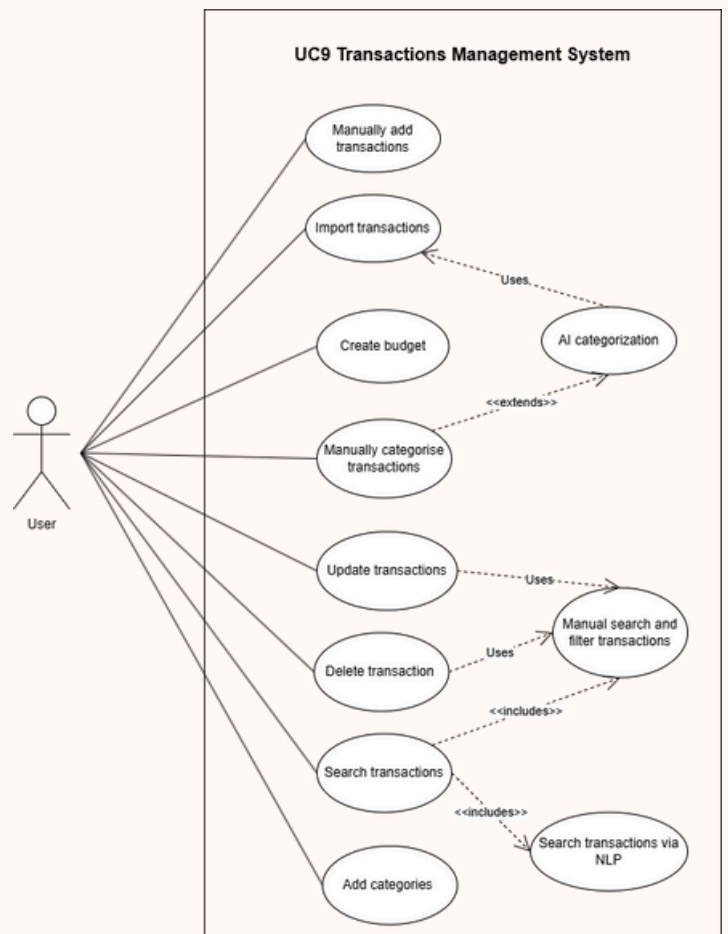
Subsystems

- Authorization & User Profile
- AR Visualization Engine
- Finance Manager
- Social Layer
- Learning Engine
- Settings and Customization

Use Cases

UC12 Individual and Group Financial Goals System

- Create financial goal
- View goal progress
- Invite friends
- Delete goal
- Join group goal
- View group progress
- Get AI insights on goal

User

UC9 Transactions Management System

- Manually add transactions
- Import transactions
- AI categorization
- Create budget
- Manually categorise transactions
- Update transactions
- Manual search and filter transactions
- Delete transaction
- Search transactions
- Search transactions via NLP
- Add categories

Uses
<<extends>>
Uses
Uses
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User

Traceability Matrix

	Authentication & User Profile	AR Visualization Engine	Finance Manager	AI Classification & Insights	Social Layer	Financial Goal Engine	Learning Engine	Settings & Customization
R1.1	X							
R1.2	X							
R1.3	X							
R2.1		X						
R2.2		X						
R3.1			X	X				
R3.2			X					
R3.3			X					
R3.4			X	X				
R4.1					X			
R4.2					X			

Traceability Matrix

	Authentication & User Profile	AR Visualization Engine	Finance Manager	AI Classification & Insights	Social Layer	Financial Goal Engine	Learning Engine	Settings & Customization
R5.1						X		
R5.2				X		X		
R5.3		X				X		
R6.1							X	
R6.2							X	
R6.3							X	
R7.1								X
R.7.2								X

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