

## The Iterative Development Process

### The Process

#### Iteration 1 - Project Initialisation, Basic Tab and Screen setup

Next.js Project Initialisation

UI Component Installations

Github Repository Initialisation

1. Testing

2. Folder Structure

2. Testing

3: Screen & Tab Structure

#### Iteration 2 - Authentication

1. Login form - Frontend

2. Login Form - Backend

#### Iteration 3 - Database initialisation

1. Database Requirements

2. Database Design

3. SQL Database Initialisation Schema

4. Enable RLS policies globally

Advanced RLS policies

Alter stock\_listing data schema

Final SQL - Database Export

### Bibliography & References

## 2.2.1 - Analysis

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### 2.1.1 - The Problem Description

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A significant issue affecting young, inexperienced investors is the lack of accessible, high-quality educational tools that allow them to learn stock trading in a realistic yet risk-free environment. According to the Royal Mint's Gen Z Investment Report, young people in the UK were projected to invest £9.4 billion during the 2022/2023 financial year. [1] Furthermore, 80% of individuals aged 16 to 25 now allocate part of their income towards investing.

With the increasing availability and popularity of commission-free trading apps, young people must be properly equipped to make well-rounded decisions

when using their money. Complex concepts such as risk management, leverage, and the psychological aspects of trading are often poorly understood by this demographic of users. With a lack of education in these areas, young investors are at a great risk of making poor financial decisions, which is exacerbated by the influence of social media and peer pressure. A notable example is the period during COVID-19, when many young people suffered significant financial losses from speculative investments in cryptocurrencies, such as Ethereum and Bitcoin, as well as NFTS (Non-Fungible Tokens).

Although there is a range of mobile stock simulators available on the App Store and Google Play Store, many are poorly designed, with overlapping elements and poor app structure, have numerous bugs due to a lack of developer maintenance, or lack the educational support needed to assist beginners. Moreover, a majority of simulators restrict access to advanced features behind premium subscriptions or advertisements, creating unnecessary barriers and friction for young users who want to gain knowledge and experience. A trend I have noted is that more advanced stock simulators are in remote places online, whilst mobile app stores are flooded with poorly designed, low-quality and very simple stock simulators, many of which run off historic or random data.

There is hence a need for a beginner-friendly, mobile-based stock trading simulator that provides a very realistic environment for novice traders. This solution must support users with interactive tutorials, customisable settings and the ability to interact with others. To meet the expectations of the younger demographic using this application, the app should include features such as competitions with friends, trading challenges and other gamification features. Other ideal features would include live news feeds, ultra-realism mode and customisable charting tools to help users gain confidence. Via user feedback and research, I will narrow down and prioritise the most important features.

I have made the decision to develop the application for mobile devices since the younger generation overwhelmingly prefers accessing digital tools via smartphones rather than desktops or laptops. This is supported by data from Ofcom's 2024 report on children's media usage and attitudes, 96% of 12–15-year-olds and 99% of 16–17 year olds in the UK own their own mobile phone.<sup>[1]</sup> On the other hand, the same report stated that they noticed a significant drop in

children's use of laptops/netbooks, seeing a decrease from 65% of 12-15 year olds using these devices to go online, to 54% in 2023. Prioritising mobile as the primary platform for my application will hence maximise accessibility and engagement for the target user base of children and young adults up to the age of 25.

## 2.1.1 - Justification for a Computational Solution

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Before beginning development, I must justify that the problem can be effectively solved using computational methods. The task of simulating stock trading with educational support is certainly well-suited for a computational solution, as it involves structured data, logical rules and lots of interaction with a user.

The application will utilise live financial data from APIs (Application Programming Interfaces) to simulate stock prices. These prices must then be analysed, and the data will be analysed and manipulated before it is displayed to the user via interactive in-app charts, which are updated at regular intervals, chosen and customised by the user. When a user chooses to buy or sell a stock, the application backend will then have to record the transaction and an advanced algorithm will then start to calculate the profit/loss for that position, considering many different factors such as the stock's price, leverage, trading fees and dividends, dependent on the user's customisation settings.

This computational problem can be broken down into several sub-problems:

- **API Data Fetching & Storage:** The application must retrieve live stock data using APIs and must then store data such as price history and the user's data in a large and robust backend database.
- **Trading Algorithms:** I will need to create algorithms to process trades, calculate the user's account value and consider real market conditions and other user customisable settings.