System Requirements Specification

FOR

stockGenie

Version 1.0
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1. INTRODUCTION

1.1. Purpose

The purpose of this document is to describe the features and functionalities of our forthcoming application, StockGenie. This document will detail the target audience, interactions within the system, user roles, and the comprehensive functionality of StockGenie, emphasizing its machine learning capabilities for predicting stock prices based on fundamental analysis and current events.

1.2. Scope

StockGenie is a sophisticated platform designed to predict stock prices using advanced machine learning techniques. It enables users to create personal accounts, manage a wishlist of stocks they are interested in, and receive tailored predictions and analyses. The application is geared towards empowering investors with insights derived from fundamental analysis, taking into account the impact of current events on stock prices.

1.3. Users

The primary users of StockGenie are individual investors, financial analysts, and market enthusiasts. Users can create personal accounts to track their favorite stocks, manage their wishlist, and access personalized predictions and insights. Financial analysts can leverage the platform's data-driven insights for deeper market analysis, while market enthusiasts can explore and learn about stock market trends and predictions.

1.4. Definitions

- Investor: An individual who uses StockGenie to track and analyze stock market trends and predictions.
- Financial Analyst: A professional user who utilizes the advanced features of StockGenie for in-depth financial analysis and market forecasting.
- Wishlist: A personalized list of stocks that a user follows, allowing them to receive specific predictions and updates.
- User Account: A personal profile within StockGenie where users can manage their preferences, wishlist, and access tailored stock market insights.

- Predictive Analysis: The application's core feature, using machine learning to forecast stock prices based on fundamental analysis and current events.
- Dashboard: The main interface upon login, presenting users with options and features relevant to their interests and activities within StockGenie.

1.5. References

There are no references used as of *December 15, 2023.*

2. OVERALL DESCRIPTION

1. Product Perspective

StockGenie is an advanced, web-based platform designed for stock market analysis and prediction. This system leverages machine learning to offer accurate stock price predictions based on fundamental analysis and current events. Accessible through any modern web browser, StockGenie is compatible with various devices including smartphones, laptops, and desktops, ensuring user convenience and flexibility.

2. Product Functions

1. *Investor Functions*

Investors in StockGenie have the ability to view and manage stocks supported by StockGenie. Investors can favorite stocks and add it to several personal boards tied to their account, including a board for stocks they are currently invested in and stocks they wish to keep track of. The investor can request StockGenie's prediction models to create a new prediction for a selected time interval. Investors must be able to create a unique stockGenie account, providing an email and password.

2. *Manager Functions*

Managers of StockGenie hold administrative privileges. They can oversee and modify both investor and analyst accounts. This includes updating stock prediction models, managing access to advanced analytical tools, and addressing any account-related issues. They also have the authority to customize the platform's functionality to better suit the needs of different user groups. Lastly, managers can view and analyze user interaction data across the platform, ensuring a comprehensive understanding of user needs and preferences in stock market analysis.

3. **User Characteristics**

The intended users of StockGenie are individual investors, financial analysts, and market enthusiasts. These users may vary widely in age, ranging from young adults exploring the stock market for the first time to seasoned elderly investors. Proficiency in English is expected, either as a primary language or through the use of translation tools. The technological skill levels of these users are also diverse, from beginners to experts, but a fundamental ability to navigate standard web-based systems is assumed.

Financial analysts, representing a more specialized user category, are expected to have a more advanced understanding of financial systems and basic computer skills. Any specific training required to use StockGenie's advanced features will be provided as necessary.

4. **Design and Implementation Constraints**

StockGenie is designed to be accessed via web browsers on various devices, catering to individual investors and financial analysts alike. The platform is intended to be operational 24/7, except during scheduled maintenance or updates. The responsiveness and speed of the system will depend on the user's internet connection quality and the capabilities of their device.

5. **Assumptions and Dependencies**

It is assumed that all users of StockGenie, whether they are casual investors or professional analysts, will have access to a device such as a computer or smartphone that supports modern web browsers. A reliable internet connection is also presumed to

be available for these devices. Furthermore, the system's design relies on the assumption that all users will have a valid email address for account creation and receiving updates and confirmations related to their activities on the platform.

3. EXTERNAL INTERFACE REQUIREMENTS

1. Investor Interfaces

3.1.1 Login Interface

The StockGenie login interface is streamlined for user convenience, requiring just an email and password for access. At the top of the screen, users will be greeted by a dynamic ticker tape displaying real-time stock market updates and trends. This feature adds an immediate, engaging overview of the market as soon as users log in.
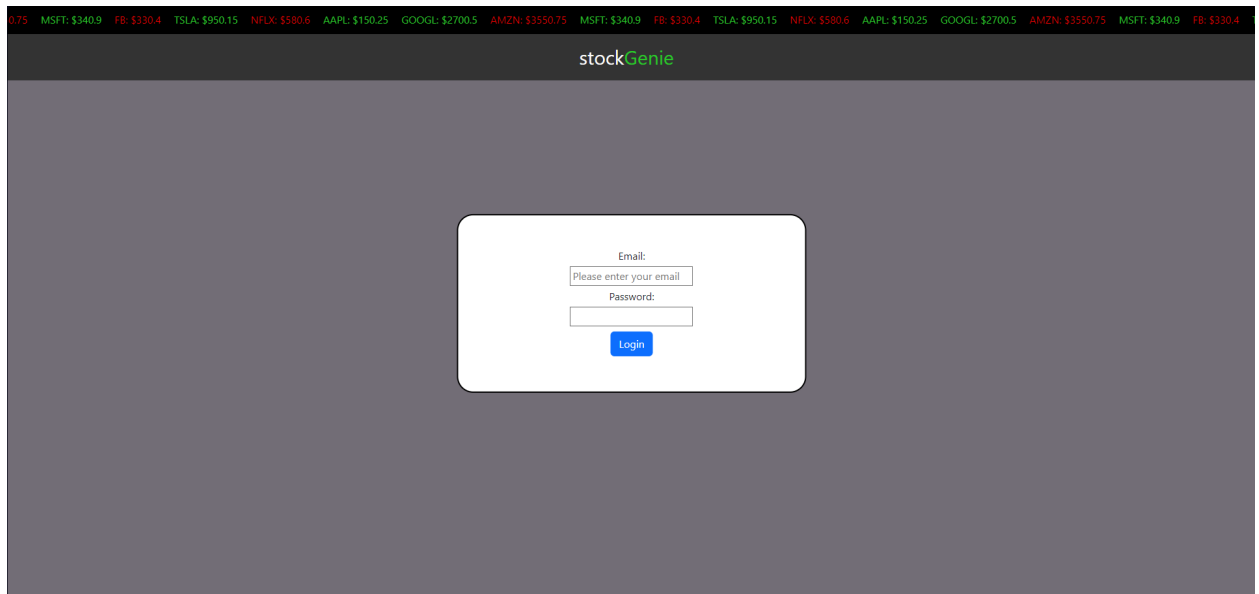

Figure 1: Login screen for all users

3.1.2 Home Interface

Once logged in, users will land on the home interface, which prominently displays their personal wishlist of stocks. This wishlist is the core feature of the interface, allowing users to quickly view and manage the stocks they are tracking. A "Featured Stocks" tab at the top of the screen provides insights into notable market movements and potential investment opportunities.

Additionally, the home interface includes a continuously flowing ticker tape, similar to the login screen, keeping users updated on broader market trends. A key highlight is the predictive graph, which forecasts the potential performance of the user's portfolio based on the stocks currently in their wishlist. This graph offers a visual representation of expected gains or trends, aiding users in making informed investment decisions.
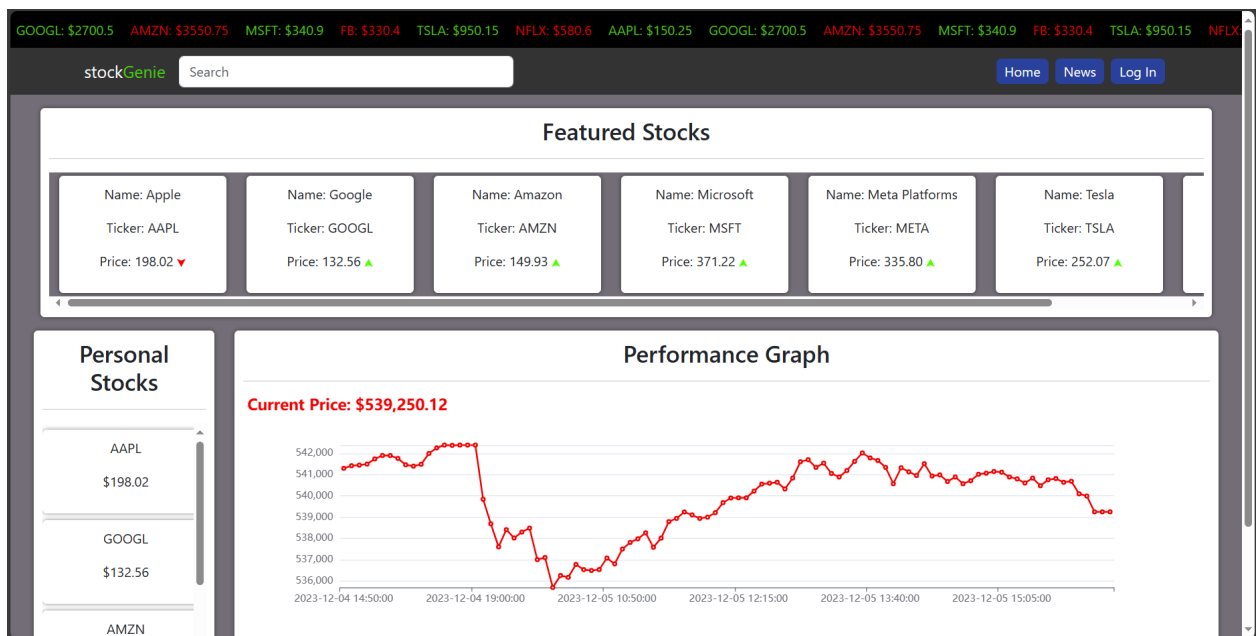

Figure 2: Home screen of stockGenie

3.1.3 Individual Stock Interface

When a user searches for a stock using the search bar in StockGenie and selects a specific stock, they will be directed to the Individual Stock Interface. This interface is designed to provide detailed insights about the chosen stock. At the forefront of this interface is a dynamic graph displaying the predicted future price of the stock, offering users a visual and data-driven projection of its potential market performance.

The top of the screen will maintain a consistent presence of the ticker tape, similar to the home and login interfaces. This ticker tape ensures that users stay informed about the overall market trends and updates while they are analyzing a specific stock.

This interface is tailored to provide users with comprehensive and in-depth information about individual stocks, making it easier for them to make informed investment decisions. The design and functionality are focused on presenting essential data in an intuitive and accessible manner, keeping in line with StockGenie's user-friendly approach.

Figure 3: Individual Stock Interface

2. **Hardware Interfaces**

For StockGenie, the hardware interfaces will consist of a primary server that hosts databases for user accounts, stock information, and predictive analysis data. This server will interface with a web server that delivers the system's frontend to investors and financial analysts. Mobile devices like tablets and smartphones may be used by users for accessing StockGenie's features remotely.

3. **Software Interfaces**

The software interfaces of StockGenie will likely incorporate a frontend utilizing frameworks appropriate for web-based applications, including options like React or Angular.

4. **Communication Interfaces**

Communication within StockGenie will predominantly occur via the web-based platform. Additional communication channels may include email notifications for updates on stock predictions, market news, and account-related alerts. Integration with an email system (SMTP) and potentially an SMS gateway may be necessary to facilitate real-time notifications and updates.

4. SYSTEM FEATURES

1. **Investor Side Functionalities**

4.1.1 Make a Prediction

An investor must be able to make a prediction of any stock that can be viewed on StockGenie.

The prediction can be presented to the investor in two ways: an instant prediction for the investor specified time in the future, providing the user with the amount the stock will go up or down from the current time the prediction was made, or a graph of a series of predictions made using a user specified time interval.

Importance: High

Dependencies: 4.1.4

4.1.2 Adding a Stock to the Personal Stocks Boards

An investor must be able to add any stock that can be viewed on StockGenie to the Personal Stocks Boards tied to their account. Any stock added must remain on the board until the user removes it.

Importance: High

Dependencies: 4.1.4

4.1.3 Removing a Stock from the Personal Stocks Boards

An investor must be able to remove any stock that is currently on the Personal Stocks Boards tied to their account.

Importance: High

Dependencies: 4.1.2

4.1.4 Creating a New Account

An investor must be able to create an account on StockGenie. The investor must provide an email and a password to be associated with the account. The email must not already be tied to a current account.

Importance: High

Dependencies:

4.1.5 Delete Account

An investor must be able to delete their account. The investor must be logged in to delete the account.

Importance: High

Dependencies: 4.1.4

4.1.6 Change Password

An investor can update their password in their account page on StockGenie or through password recovery via the account's email. To change the password on the account page, the investor must be logged in.

Importance: Medium

Dependencies: 4.1.4

4.1.7 Search Stocks

An investor can search for any stocks on StockGenie. Only stocks related to the investor's query must be shown. The investor can search by a keyword, such as a company's name.

Importance: High

Dependencies: 4.1.4

4.1.8 Filter Stocks

An investor can apply filters, such as various markets, while viewing/searching stocks on StockGenie.

Importance: High

Dependencies: 4.1.7

2. **Manager Functionalities**

4.2.1 Administrative Oversight and Account Management

Managers of StockGenie, endowed with administrative privileges, have the capability to oversee and modify both investor and analyst accounts. This encompasses tasks like updating stock prediction models, managing access to advanced analytical tools, and resolving any account-related issues. Their role is crucial in tailoring the platform's functionality to align with the diverse needs of various user groups.

Importance: High

Dependencies:

4.2.2 Customization and User Interaction Analysis

Managers are also responsible for customizing the platform to optimize user experience. This includes modifying features and tools to better serve different categories of users, such as individual investors and financial analysts. Moreover, they have access to comprehensive data on user interactions within StockGenie. This enables them to analyze patterns and preferences in stock market analysis, thereby facilitating a more user-centric approach in platform enhancements.

Importance: High

Dependencies: 4.2.1

4.2.3 Enhancing Predictive Model Accuracy

Managers play a pivotal role in refining the accuracy of stock prediction models. By analyzing feedback and performance data, they can implement improvements to the predictive algorithms, ensuring that the platform remains at the forefront of market analysis technology.

Importance: High

Dependencies: 4.2.1

2.4 Streamlining Communication and Feedback Channels

A key functionality for managers is to streamline communication channels within StockGenie. This includes ensuring transparent and efficient communication flows between investors, analysts, and the administrative team, as well as incorporating user feedback into ongoing platform development.

Importance: Medium

Dependencies: 4.2.1

5. OTHER NONFUNCTIONAL REQUIREMENTS

1. Performance Requirements

5.1.1 User accounts

The system must efficiently support one user account for each individual investor or financial analyst using StockGenie.

5.1.2 Active Users

StockGenie should be capable of handling a minimum of 100 concurrent users, ensuring that there is no significant decrease in system performance.

2. **Security Requirements**

5.2.1 Data Encryption

All communication between the client and server within should be encrypted using HTTPS to ensure the security and confidentiality of user data.

5.2.2 Authentication and Authorization

StockGenie should implement robust authentication mechanisms to accurately verify the identity of its users. Additionally, the system should enforce role-based access control, ensuring that investors and financial analysts can only access functionalities pertinent to their respective roles.

3. **Reliability Requirements**

5.3.1 Availability

StockGenie should target 99% uptime, excluding scheduled maintenance periods. This ensures that investors and financial analysts have round-the-clock access to stock predictions and analyses.

5.3.2 Data Backup

Regular, automated backups of all system data are crucial and should be conducted daily. Additionally, an offsite backup should be maintained to safeguard against data loss.

4. **Scalability Requirements**

5.4.1 Future Expansion

The design of StockGenie should be inherently scalable to support future enhancements in features and accommodate an increasing number of users and stock data.

5. **Reporting Requirements**

5.5.1 Report Generation

StockGenie should be capable of generating accurate and efficient reports on stock analyses and market trends, ensuring their timely availability for users.

5.5.2 Report Duplication

The system should prevent duplication in predictive analyses. Instead, it should allow users to append additional comments or insights to existing stock predictions for a comprehensive view.

6. **Compliance Requirements**

5.6.1 Regulatory Compliance

StockGenie must comply with all applicable data privacy and financial regulations, including GDPR and other relevant financial market laws.

5.6.2 Auditability

The system should maintain comprehensive logs of all user activities and system events, enabling effective auditing and compliance checks.

7. **Software Quality Attributes**

5.7.1 User-Friendly Interface

The graphical user interface (GUI) of StockGenie should be intuitive and user-friendly, catering to the ease of use for both individual investors and financial analysts.

5.7.2 Usability

StockGenie must be accessible and fully functional on modern web browsers across various devices, including smartphones and computers.

5.7.3 Error Handling

The system should provide clear and user-friendly error messages in case of any failures or unexpected behaviors.

5.7.4 Accessibility

StockGenie should be compliant with web accessibility standards (WCAG) to ensure its usability for individuals with disabilities.

5.7.5 Maintainability

System maintenance, testing, or restarts should be ideally scheduled during periods of low user activity. The platform should also be designed to easily accommodate an increasing number of user accounts and active users.

SIGNATURE SECTION

This Software Requirements Specification (SRS) document for the StockGenie Platform is deemed accurate and comprehensive as of December 15, 2023. By affixing their signatures below, all concerned parties acknowledge their understanding and concurrence with the specified requirements and features of StockGenie. Should there be any modifications or alterations to this SRS subsequent to the signed date, it will necessitate a mutual agreement among all parties involved, and such changes will be systematically recorded in the future iterations of this document.

Client - Dr. Hien Nguyen:

I hereby confirm that the specifications and requirements listed in this document align with our expectations and necessities for StockGenie. I understand that any modifications post this agreement may incur additional costs and time.
Signature: _____
Printed Name: Dr. Hien Nguyen
Date: December 15, 2023

Development Team:

We acknowledge that we have understood and will adhere to the specifications and requirements listed in this document for the development of StockGenie.
Thomson Toms
Signature: _____
Date: December 15, 2023
Peter Dizor

Signature: _____

Date: December 15, 2023

Jacob Bianco

Signature: _____

Date: December 15, 2023

Michael Wenger

Signature: _____

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