FINSIGHT PRODUCT MANUAL

Empowering Financial Insights

Han-Gyeol Lee

hanjie94@naver.com

Table of contents

Introduction 3
- About FinSight 3
- Purpose of This Manual 3

Technologies Used 4
- Front-End: Material UI + Next.js (TypeScript) 4
- Back-End: Spring Boot + Gradle + MyBatis 4
- Database: MariaDB 5
- Mail Server: Gmail 5

Installation & Setup 6
- System Requirements 6
- Installation Guide 7
- Configuration 9

Features Overview 10
- Login 10
- Dashboard 11
- Theme Changing (Light/Dark Mode) 14
- Language Switching (Multilingual Support) 14
- Profile Options Menu 14
- Stock 15
  - Stock List 15
  - Stock Detail 16
  - Market Overview 19
  - Data File Management 20
- System 22
  - User Management 22

Menu Management 23
Role Management 23
Scheduled Tasks 25
Custom Data Table 26

Introduction

About FinSight

FinSight is an advanced platform that helps individuals and organizations gain actionable financial insights. By integrating reliable data sources such as Free Stock Market APIs and Financial Statements APIs, FinSight simplifies complex financial analysis. Whether you're an experienced investor, a financial analyst, or a beginner in financial markets, FinSight provides the necessary tools to navigate with confidence and clarity.

Purpose of This Manual

This manual aims to demonstrate the technical skills and problem-solving strategies employed in developing the program. It not only covers the technologies and methodologies used but also provides insights into the thought process behind overcoming challenges and delivering effective solutions.

Additionally, this manual serves as a comprehensive guide to help users:

1. Quickly install and set up the program with minimal effort.
2. Understand the core functionality to efficiently analyze or work with the system.

By offering clear and structured documentation, this manual ensures that anyone—whether using, evaluating, or developing the program—can achieve their goals with ease and confidence.

Technologies Used

Front-End: Material UI + Next.js (TypeScript)

- **Framework:** Next.js 14 - A React-based framework used for building server-rendered and statically generated web applications. The project utilizes the latest features such as the next/navigation API for routing.
- **UI Library:** Material UI - A popular React component library for creating visually appealing and accessible user interfaces with pre-built and customizable components.
- **Language:** TypeScript ensures type safety and provides a better developer experience by reducing bugs and enhancing code clarity.

Back-End: Spring Boot + Gradle + MyBatis

- **Framework:** Spring Boot - A Java-based framework used for developing scalable and secure REST APIs.
- **Build Tool:** Gradle - A powerful and flexible build automation tool used for managing project dependencies and automating builds.
- **Database Mapper:** MyBatis - An SQL mapper framework to handle database interactions with customized queries, leveraging SqlSession for efficient query execution.
- **Financial Data Integration**
  - FMP (Java): Used to retrieve financial quote data, offering extensive market insights and stock-related financial information.
  - YFinance (Python): Utilized to obtain index data, providing real-time and

historical market data for various financial indices.

Database: MariaDB

- **Database System:** MariaDB - A robust, open-source relational database management system that provides high performance and compatibility with MySQL.

Mail Server: Gmail

- **Mail Server:** Gmail - Used as the mail server for handling email communications securely and efficiently.

Installation & Setup

System Requirements

Before installing FinSight, ensure that your system meets the following minimum requirements:

- **Hardware Requirements:**
  - CPU: Dual-core processor or higher (Intel/AMD)
  - RAM: 8GB or more (16GB recommended for better performance)
  - Storage: At least 100GB of free disk space
- **Software Requirements:**
  - **Operating System:** Windows 10/11, macOS, or Linux (Ubuntu 20.04+ recommended)
  - **Front-End:**
    - Node.js (v18 or later)
    - npm or yarn
  - **Back-End:**
    - Java 17+ (JDK)
    - Gradle 8+
  - **Database:**
    - MariaDB (v10.6 or later)

- **Others:**
  - Python 3.9+ (for YFinance data retrieval)
  - Gmail account for email notifications
- **FMP API Key** (for financial market data retrieval) – You can obtain an API key by signing up at [Financial Modeling Prep].

Installation Guide

Follow the steps below to install and set up FinSight:

The source code is not provided directly. However, you can explore all features through the provided demonstration videos.

If you are interested in my portfolio and would like to review the code or schedule an interview, please feel free to contact me via email, and I will be happy to share the source code.

Clone the repository

```
git clone https://github.com/yourusername/FinSight.git
cd FinSight
```

Front-End Setup

```
cd frontend
npm install   # or yarn install
npm run dev   # Start development server
```

Back-End Setup

```
cd backend
./gradlew build   # Build the backend
java -jar build/libs/finsight.jar   # Run the backend server
```

Database Setup

```
Install MariaDB and create the required database:
CREATE DATABASE finsight_db;
Configure the connection settings in application.properties:
spring.datasource.url=jdbc:mariadb://localhost:3306/finsight_유
spring.datasource.username=root
spring.datasource.password=yourpassword
```

Python Setup for Financial Data Retrieval

```
pip install yfinance
python backend/script/python/fetch_sp500_index.py   # Test fetching stock index data
```

Database Initialization

To set up the database structure, follow these steps:

- Navigate to the Import Script Directory: backend₩script₩import
- Modify Database Connection Settings
    - Open config.bat
    - Update the database connection details as required.
- Execute the Import Script
    - Run import_all.bat to create database objects, including tables, foreign keys, and initial data.

Configuration

To configure the application, update the following settings:

Mail Configuration

```
Set up Gmail SMTP in application.properties:
spring.mail.host=smtp.gmail.com
spring.mail.port=587
spring.mail.username=your-email@gmail.com
spring.mail.password=your-app-password
spring.mail.properties.mail.smtp.auth=true
spring.mail.properties.mail.smtp.starttls.enable=true
```

Financial Data API Configuration

```
Add fmp license key in application.properties:
fmp.api.key=your_fmp_api_key_here
```

Features Overview

Login

Demo video

- **1. Sign-Up**

  Allows new users to create accounts.

  - **Features**
    - **Input:** Email, Username, password, and password confirmation
    - **Password Requirements:** Minimum 8 characters, including uppercase, lowercase, number, and special character
    - **Validation:** Prevents duplicate accounts and provides clear error messages for invalid data

- **2. Forgot Password**

  Helps users recover their accounts by resetting their passwords.

  - **Features**
    - **Inputs:** Registered email address.
    - **Reset Process:** Sends a random password to the user's email.
    - **Password Reset:** Allows users to log in using the new password and update it later.

- **3. Login**
  - **Features**
    - **Input:** Email and password fields

        - **Remember Me:** Saves the email for future logins
        - **Forgot Password:** Provides account recovery options
        - **Validation:** Ensures a valid email format and a password of at least 8 characters
        - **Post-login Redirect:** Upon successful login, users are redirected to their default page. The default is set to /, which is the dashboard, but users can customize it.

Dashboard

[Demo video]

The dashboard provides a comprehensive overview of the stock market performance and key financial insights. It consists of the following sections:

- **1. Index Charts**

  Displays the performance of major stock market indices:

    - **Market indices**
        - S&P 500
        - Dow Jones
        - Nasdaq
    - **Data Source**
        - Index data is retrieved using the `yfinance` Python library.
    - **Features**
        - Displays last 30 days' trends.
        - Percentage changes are highlighted in green (positive) and red (negative).

- **2. Top Gainers, Top Losers, and S&P 500 Constituents**

  Provides insights into stock highlights

  - **Stock highlights**
    - Top Gainers: Top 30 stocks with the highest percentage increase.
    - Top Losers: Top 30 stocks with the highest percentage decrease.
    - S&P 500 Constituents: List of S&P 500 companies.
  - **Interaction**
    - Clicking on the title of each list redirects to the Market Overview Page, where detailed information on selected stocks is displayed.
    - Clicking on a ticker redirects to the Ticker Detail Page, providing in-depth information about the selected stock.

- **3. Financial Terms**

  A tree-view document that explains various financial terms

  - **Terms**
    - Financial Performance
    - Market Value
    - Ratios & Margins
    - Cash Flow
    - Stock Price & Volatility
    - Trading Volume & Shares
    - Dividends & Splits
    - Miscellaneous
  - **Interaction**
    - Clicking on each term displays a popup window with a detailed

description of the selected term.

- **4. S&P 500 Sector Composition**

  Visual representation of the distribution of companies within the S&P 500 across various sectors.

  - **Components**
    - A circular chart illustrating sector composition.
    - A percentage list showing the number of companies in each sector.

- **5. Stock Heat Map**

  Provides a visual representation of stock performance

  - **Indexes Covered**
    - S&P 500
    - Dow Jones
    - Nasdaq 100
  - **Features**
    - Box sizes are proportional to market capitalization.
    - Minimum box size is maintained for companies with smaller market caps to ensure visibility.
    - Ticker symbols and percentage changes are displayed within each box.
  - **Interaction**
    - Users can click to view heat maps for all sectors or filter by individual sectors.
    - These features provide users with a holistic view of the market, helping them analyze trends and make informed decisions.

Theme Changing (Light/Dark Mode)

Demo video

The FinSight web application provides a theme-changing feature that allows users to switch between light and dark themes for a customized viewing experience. By default, the application is set to light theme, offering a bright and clear interface. Users can easily toggle to dark mode based on their preference.

Language Switching (Multilingual Support)

Demo video

The FinSight web application includes a language-switching feature that allows users to toggle between supported languages for a localized experience. Currently, the application supports **Korean and English**, with the flexibility to add more languages in the future. This feature enhances accessibility and usability for a diverse user base.

Profile Options Menu

Demo video

The Profile Options Menu provides users with essential account-related actions to enhance usability and accessibility.

- **1. Logout**

  Provides a secure way to sign out of the current session.

  - **Features**
    - Ends the active session and redirects to the login page.

        - Clears session-related data securely.

- **2. Change Default Page**

  Allows users to set their preferred landing page upon login.

  - **Features**
    - Customizable default page selection based on user preferences.
    - Automatically redirects the user to the selected default page upon future logins.
    - Applies changes immediately by reloading the page to the newly set default page.

Stock

Stock List

Demo video

The Stock List page provides stock data from various markets, including the US market. It allows users to search, view, and update stock information easily.

- **1. Update Stock List**

  Users can update the stock list by clicking the "UPDATE STOCK LIST" button.

  - **Features**
    - Updates over 80,000+ stocks, ensuring the latest stock market data.
    - Retrieves stock information from the `Financial Modeling Prep API`.

- **2. Search Functionality**

  The page allows users to search for stocks using different conditions

- **Features**
  - Ticker Autocomplete: As users type a ticker symbol, similar matches are suggested dynamically.
  - Company Name Search: Users can search for stocks by entering the full or partial company name.
  - Asset Type Filter: Filters stocks based on asset type (e.g., stock, ETF, etc.).

- **3. Data Table**

  Displays stock information in an organized, paginated format.

  - **Features**
    - Users can download the stock data in Excel format by clicking the export button.
    - Clicking on a ticker redirects users to the detailed stock information page, providing further insights.
    - Supports pagination to navigate through large datasets (e.g., showing 50 rows per page).

Stock Detail

Demo video

The Stock Detail page provides in-depth insights into a specific stock's performance and financial data. Users can analyze various metrics through interactive charts and update financial data to ensure accurate and up-to-date information.

- **1. Navigating to the Stock Detail Page**

  Users can access this page by clicking a ticker symbol from the Stock List page, which redirects them to the corresponding stock's detail page.

- **2. Update Financial Data**

  Users can update the latest financial data by clicking the "REFRESH ALL DATA" button.

  - **Features**
    - Fetches up-to-date financial data from the `Financial Modeling Prep API`.
    - Ensures accuracy with the most recent market and financial reports.
    - Automatically refreshes charts and key financial metrics after an update.

- **3. Stock Overview Section**

  The detail page provides key stock information at a glance

  - **Features**
    - Stock Price Metrics: Previous close, open price, day's range, and 52-week range.
    - Market Data: Market capitalization, volume, and average volume.
    - Performance Ratios: PE ratio (TTM), EPS, and beta values.
    - Earnings Date: Upcoming earnings report schedule.

- **4. Financial Charts and Analysis**

  The Stock Detail page offers a variety of interactive charts to analyze stock performance and financial trends over different timeframes.

  - **Features**
    - Multiple Timeframes: Users can view data over various periods, such as 5 days (5D), 1 month (1M), 3 months (3M), year-to-date (YTD), 1 year

(1Y), 5 years (5Y), and all available data.

- Close Price Analysis: Tracks the historical movement of stock prices with detailed trend visualization.
- PER (Price-to-Earnings Ratio) Chart: Displays the historical trend of the stock's P/E ratio, allowing users to evaluate valuation changes over time.
- EPS (Earnings Per Share) Comparison: Displays earnings trends with a breakdown of basic and diluted EPS values.
- Profitability Ratios: Visualizes key ratios such as Gross Profit Ratio, EBITDA Ratio, and Net Income Ratio to evaluate financial health.
- Revenue vs. Profit Trends: Compares revenue growth and profit margins over multiple years for better investment insights.
- Cash Flow Analysis: Tracks free cash flow versus net income and visualizes cash inflows and outflows over time.
- Dynamic Filtering: Users can switch between different time intervals and metrics with interactive filters.

- **5. Financial Statements**

  The Financial Statements section provides detailed financial data categorized under income statements and balance sheets.

  - **Features**
    - Annual and Quarterly Views: Users can toggle between annual and quarterly financial data for a more granular analysis.
    - Export to Excel: Allows users to download financial data in Excel format for offline analysis.

- Comparative Analysis: Enables users to compare financial performance across different periods side-by-side.

Market Overview

Demo video

The Market Overview page allows users to explore stock market insights by selecting a single analysis type at a time and applying search conditions. It provides flexibility to analyze market trends efficiently.

- **1. Analysis Types**

  Users can select from different analysis types to view specific stock lists.

  - **Features**
    - Top Gainers: Displays the top 30 stocks with the highest percentage increases.
    - Top Losers: Shows the top 30 stocks with the highest percentage decreases.
    - S&P 500: Lists stocks included in the S&P 500 index.
    - Customizable Options: Users can define their own analysis types to tailor stock insights to their needs.

- **2. Search Functionality**

  The page offers flexible search options to refine stock lists based on user-defined criteria.

  - **Features**
    - Ticker Search: Enter a stock ticker to retrieve relevant market data.
    - Company Name Search: Search for stocks by entering full or partial

company names.

- Expandable Search Conditions: Additional search filters can be added to refine results further.

- **3. Data Table**

  Displays the filtered stock data in a well-structured format.

  - **Features**
    - Key Metrics Displayed: Includes ticker, company name, price changes, market cap, and P/E ratio.
    - Sortable Columns: Users can sort data by percentage change, previous close, or market cap.
    - Excel Export: Download the displayed data for offline analysis.
    - Ticker Click Navigation: Clicking on a ticker redirects to the stock's detail page.

Data File Management

[Demo video]

The Data File Management page allows users to upload, manage, and track stock-related files efficiently. Users can upload files of specific types, view upload history, and delete records as needed.

- **1. File Upload**

  Users can upload different types of files by selecting the corresponding category.

  - **Features**
    - Three Upload Categories
      - S&P 500 Constituents: Uploads files containing S&P 500 stock

symbols.

        - Dow Jones Constituents: Uploads files containing Dow Jones stock symbols.
        - Nasdaq 100 Constituents: Uploads files containing Nasdaq 100 stock symbols.
    - Additional Categories: More categories can be added in the future to accommodate different stock indices or financial data.
    - Button Descriptions: Clicking on a category button will display additional information about the required file format and content.
    - File Format Restrictions: The system can limit allowed file formats (such as .txt, .xlsx, etc.)
    - File Limit Control: The system can limit the number of files uploaded at once.
    - Upload Options
        - Drag and drop functionality for easy file uploads.
        - Clicking the upload area to select files manually.

- **2. Upload History Management**

  Users can track their uploaded files with timestamps and manage them accordingly.

  - **Features**
    - File Download: Previously uploaded files can be downloaded directly.
    - Uploader Information: Displays the name of the user who uploaded the file along with the timestamp.
    - Delete Functionality: Users can select and delete specific files from the upload history.

System

User Management

[Demo video]

The User Management page allows users to search, add, edit, delete, and export user data efficiently.

- **1. Search Functionality**

  Users can search for existing accounts using the available search fields.

  - **Features**
    - Search by User Name, Email Address, and Permission Level, with the option to add more search filters in the future.

- **2. Data Table**

  The data table displays user information and provides various management options.

  - **Features**
    - Global Search: Allows users to search across all displayed data.
    - Add New Users: Click the plus (+) button to add a row (all required fields must be filled before saving).
    - Random Password Generation: When a new user is added, an email is sent with login credentials.
    - Edit and Delete: Users can modify or remove existing records.
    - Excel Export: Download user data in `.xlsx` format.

Menu Management

[Demo video]

The Menu Management page enables users to view, edit, and organize menu data displayed in a tree structure.

- **1. Data Table**
  - **Features**
    - Tree Data Display: The table supports hierarchical data, enabling users to view parent and child menu relationships.
    - Expand/Collapse All:
      - Expand All: Displays all child menus for better visibility.
      - Collapse All: Hides all child menus, showing only parent menus.
    - Editable Columns: Certain fields, such as Menu Name and Order, can be edited directly within the table.
    - Save Changes: Clicking the Save button applies updates and reloads the menu content to reflect the updates.
    - Excel Export: Download user data in `.xlsx` format.

Role Management

[Demo video]

The Role Management page allows administrators to configure role-based permissions, determining whether users with a specific role can view or edit each page in the system.

- **1. Search Functionality**

Users can search for menu items to configure permissions using the available search fields.

- **Features**
  - Search by Permission, with the option to add more search filters in the future.

- **2. Data Table**

The data table in the Role Management page displays menu items and allows administrators to manage permissions for viewing and editing pages.

- **Features**
  - Tree Data Display: The table supports hierarchical data to show parent and child menu relationships.
  - Expand/Collapse All:
  - Expand All: Displays all child menus for better visibility.
  - Collapse All: Hides all child menus, showing only parent menus.
  - Editable Columns: Administrators can toggle viewable and editable permissions directly in the table.
    - Viewable: Determines whether users with the selected role can access the corresponding page.
    - Editable: Determines whether users with the selected role can modify data on the corresponding page.
  - Save Changes: Clicking the Save button applies updates and reloads the menu content to reflect the updates.
  - Excel Export: Download user data in `.xlsx` format.

Scheduled Tasks

Demo video

The Scheduled Tasks page allows administrators to manage and execute scheduled jobs.

- **1. Search Functionality**

  Users can search for specific scheduled tasks using the available search fields.

  - **Features**
    - Search by
      - Schedule ID
      - Class Name
      - Method Name

- **2. Data Table**

  The data table displays details of scheduled tasks, including execution settings and descriptions.

  - **Features**
    - Manual Execution: Users can manually trigger a scheduled task by clicking the play button (▶).
    - Editable Fields:
      - Class Name, Method Name, Cron Expression, and Activation Status can be modified directly in the table.
    - Save Changes: Clicking the Save button saves the changes, and the program will re-schedule the tasks accordingly.

Custom Data Table

Demo video

This custom-built data table mimics commercial solutions using open-source technologies like **React**, **@tanstack/react-table**, and **MUI**.

- **1. Toolbar**

  The toolbar provides various utilities for managing the data table efficiently

  - **Features**
    - Global Search: Allows users to search for any value within the table.
    - Expand All / Collapse All: Expands or collapses all rows to view hierarchical data.
    - Add/Delete Rows: Users can add new rows to the table or delete selected rows.
    - Export to Excel: Enables users to download the table data in Excel format.
- **2. Table Body**

  The main content area of the table provides various functionalities

  - **Features**
    - Expandable Rows: Certain rows contain subRows that can be expanded or collapsed for hierarchical data visualization.
    - Link Cells: The "Product ID" column contains clickable links that navigate to the respective product details page.
    - Checkbox Cells: The "Stock" column includes checkboxes for selection.
    - ComboBox (Dropdown) Cells: The "Category" column provides a

dropdown selection with predefined options.

- Editable Cells: The "Product Name" and "Price" columns are editable, allowing modifications directly in the table.

- **3. Footer**

The footer provides pagination and navigation controls

- **Features**
  - Pagination: Allows users to navigate through multiple pages of data.
  - Rows per Page Selector: Users can adjust the number of rows displayed per page.
  - Total Records Indicator: Displays the total number of available records.