Super Stock Screener

Business Case and Draft Plan by Team 17

1 Business Case

1.1 Executive summary

Stock screeners are software tools that take in a set of user defined conditions and filters stocks based on those conditions. These tools are useful because stock markets produce a vast amount of data daily, and it is impractical for investors to manually review the data of various stocks they may be interested. Super stock screener provides an effective screening method that takes a set of stocks and, through data analysis, identifies the best performing and highest potential stocks for investors to consider daily.

1.2 Project Motivation

In 2019, the global stock market consisted of over 43,000 publicly traded companies with stocks valued at about US$79 trillion [1]. The trading data for each of these stocks is recorded daily and for the more commonly traded stocks, trading data is recorded data by the second. Investors in the stock market analyse the data related to the price of a stock and other metrics of the underlying company to determine whether the stock's performance is in line with their investment strategy. As there are many different stocks to consider and a vast dataset of trading history, investors utilise stock screeners to automate the process of identifying stocks that meet their unique criteria.

There are many stock screeners on the market today with free and paid options for users to choose from. Each stock screener provides a range of options with which users set their unique screening criteria. The problem with most screeners is that the options provided are often based on generic and simplified methods of market analysis that do not provide good quality insights into a stock's performance on its own or relative to other stocks. This means that users need to apply financial knowledge to further shortlist stocks based on their own criteria.

1.3 Project activities

Our team's task is to develop an effective and scalable stock screener that analyses past trading data of a set of stocks selected by a user and generates indicators that will then be used to filter stocks based on pre-defined conditions. The resulting subset of stocks will then be presented in a user interface along with data about the underlying companies of selected stocks.

The stock screener relies on accurate and complete trading data for indicators to be generated, therefore, four years of trading data shall be gathered from reliable sources, organised, and stored in a database. This process is prone to various technical issues so quality assurance measures shall be setup to validate and verify the data. With the available data, extensive analysis shall be carried out to identify price trends and other patterns of interest. The results of these analysis shall be stored in a database as indicators to be used for further screening. The trading data and indicators shall then be used to filter selected stocks against a set of carefully formulated conditions that aim to identify what stocks are performing the best.

For the subset of stocks identified to have met the screening conditions, further information about the underlying company's performance is gathered to be presented to users along with the screening results.

Depending on time constraints and the quality of the screening process described, the stock screener's user interface could be improved to handle more dynamic user interaction like changing pre-defined conditions.

1.4 Benefits

Super Stock Screener offers the following benefits to users.

- The main benefit of Super Stock Screener is providing investment opportunities to users as there is a large amount of stock data from different indexes globally available. Users will be able to screen and search for potential stocks that has a high relative strength rating and good price momentum.

- As dataset is updated daily and data assurance is performed continuously, users can be assured that all the stock information available is reliable and accurate which can lead to good investment decisions.
- Having well-defined and easy-to-use screening features, Super Stock Screener can help users to easily find stocks that match with their investment strategies. More importantly, users are expected to be more efficient as they would be able to save a considerable amount of time in screening and searching for potential stocks to invest in.
- Users would have several screening criteria available to screen stocks ranging from relative strength rating, technical indicators on price momentum to fundamental information. With that, users can be assured that they would have all necessary information to support their investment decisions.

1.5 Goals

Super Stock Screener aims to achieve the following goals by the end of this semester.

- To create a reliable and accurate stock screener for professional investors such as portfolio managers, and financial analysts.
- To develop a reliable and efficient screening methods that users can use to find potential investment opportunities.
- To develop a scalable backend and database that can process and store thousands of stocks from different stock markets globally.
- To design and create an easy-to-use stock screener with a user-friendly interface.

1.6 Future Plan

Despite the time to develop Super Stock Screener is limited, team expects that the project can be further developed in the following areas in the future.

- Provide different versions and screening features to various levels of users from no-finance background investors to financial professionals.
- Develop a mobile web interface to allow users to screen stocks using their smart phones which could potentially attract more users to use Super Stock Screener.
- Create features and functions to analyse users' investment strategies and preferences to provide personalised stock information.
- Provide an open source for programmers to progress on this project (or any programmer who wants to build a stock screener product that they can refer to).

2 Draft Plan

2.1 Project activities

Milestone 1	Activities	Projected Outputs
Backend application with a function of relative strength rating and technical conditions integrated with database	Research, study and requirements gathering	List of client's requirements
	Setup server and database and design database schema	Working server and database and a design of database schema
	Define SQL queries within Python classes	Executable Python functions that update database
	Data fetching from financial APIs and populate database	Database with all required entities
	Quality assurance	A reliable dataset of stocks
	Create Relative Strength Rating	Relative strength rating function in the backend application
	Create technical conditions	Function that can screen stocks based on the 8 technical conditions

Table 1: Summary of activities for milestone 1

As shown in Table 1, team aims to complete the following activities to achieve milestone 1

- **Research, study and requirements gathering**: The main purpose of this activity is to gain knowledge on the overall concepts and functions of stock screeners. In addition, team also consults with the client to gather requirements of the project. The projected output for this activity is a list of client's requirements.
- **Setup server and database and design database schema**: Server and database are required and needed to store stock data. To organise stock data in the database, database schema is needed as it helps to define the structure of the database and also set relationships between tables and entities in the database. The projected output for this activity is a working server and database and a design of database schema.
- **Define SQL queries within Python classes**: After having database schema, team will define SQL queries within Python classes to perform tasks such as creating tables, inserting, deleting, updating and selecting data in the database. The projected output for this activity is executable Python functions that update database.
- **Data fetching from financial APIs and populate database**: Team plans to use financial APIs to fetch stock data and populate the data into the database using SQL queries created previously. The projected output for this activity is a database with all required entities.
- **Quality assurance**: Perform database testing to ensure data integrity and check if the structure of the database aligns with the database schema. The projected output for this activity is a reliable dataset of stocks.
- **Create Relative Strength Rating**: The initial criteria used to screen stocks is relative strength rating which calculate stocks' daily price percentage change over the last 12 months and then assign percentile rank in order of greatest price percentage change. A projected output for this activity is a relative strength rating function.
- **Create technical conditions**: The second criteria for screening is a set of 8 technical conditions which aims to capture stocks with good momentum over the last 12 months. A projected output for this activity is a function that can screen stocks based on the 8 technical conditions.

2.2 Team Collaboration

- **Weekly Meetings**
  Team has agreed on having two weekly meetings to update the overall progress of the project, solve issues if any and make sure that all activities are being implemented as planned.
- **Using Trello to check status of the project**
  Team has set up Trello accounts to track status and know the expected completion of assigned tasks. This helps team to hold each other accountable and keep all team members on the same page.
- **Using GitHub for version control**
  Team has used GitHub to store, manage, track and control changes of the codes developed by each team member.
- **Using OneDrive for collaborating project documents**
  Team has shared and collaborated non-code project documents on OneDrive which allows us to work on presentation and reports together.

2.3 Communication Plan

Communication types	Communication tools
Internal	WhatsApp
	Zoom
	Discussion Room
External	Email
	Slack
	Zoom/Discussion Room

WhatsApp is used internally by the team as a tool for daily communication. Team members usually discuss small issues or update on changes made through WhatsApp group. However, if there are critical issues or team voting needed, team would have meetings which are held at least twice a week via Zoom. Also, meetings are sometimes hybrid (remote and face-to-face), with in-person members meeting in university discussion rooms.

Team's external communication is mainly through email, slack and zoom/discussion room. Normally team members communicate with supervisors via email. Regarding customer communication, the team uses slack according to the customer's preference. Client meetings will be held using zoom or university discussion rooms according to the client's request.

References

[1] Data.worldbank.org. 2022. *Financial Sector* | *Data*. [online] Available at: <https://data.worldbank.org/topic/financial-sector> [Accessed 4 April 2022].