Stock Market Investment Fantasy Project

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Abstract **- In this paper, we argue that the stock market can be conceived, somehow, as a fantasy league project if it is played well. Envisioning the stock market within the fantasy sports framework, can stimulate the stock market investment and improve the chances for success. The player or investors can view the stock market as a checking list of the stock and their performance before do one' shopping. While the project was a software engineering item, the backend project has a front office website by which investors can see the stock and make a decision. This project will use the Nested IF-THEN-ELSE-END IF statements to check prices of specific stock at particular time, in order to make decision on buying, holding, or selling, according to its actual performance. A wide range of stock prices prediction approaches are used in addition to the event driven actions.**

Keywords **Event-Driven, Fantasy League, Artificial Neural Network, Support Vector Machine, Genetic Algorithm, and Multiple Kernel Learning.**

1. Introduction

The fantasy league sports are increasingly popular online games simulating virtual teams. They are formed from actual on-the-field official players of that sport. In these types of games, the hoarded virtual teams' performance is compiled and based on the statistical performance of each corresponding player in the actual game. It is easy to observe that the stock market is like fantasy sports due to its unpredictability. Within fantasy sports framework, the stock market investments can be stimulated to improve the chances for success in stock market investments. The amount spent on league entrees fees, and the time spent on fantasy football is close to the amount of time and money spent by stock market investors in their stock market, which can also be equated to the amount of time, and mostly in lost productivity based on the US median wage. Just like in the stock market, a larger percentage (89.6%) of the season-long players, there are much expectation on behalf of positive return on investments (ROI). To manage a stock portfolio, there are strategies that can be leveraged by the stock market in the same way as it is done in the fantasy league [2]. This includes depth and diversification in growth stock and value the stock, which depends on the investments goals and risk appetite both investor or fantasy league player. Just like in the stock market where the best performing stock with a track record of positive growth is selected, the core players and the ones that can be easily traded because of their best performance are chosen. At game time, the fantasy league player only uses the preselected teams just like in the stock market. Actors and goals of the stock market/ fantasy league are to create an account with security credentials to access their portfolio and information.

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2. Functional Requirement Specification

A. Stakeholders

The stakeholders comprise both internal and external stakeholders. The internal stakeholders are owners, manager, and employees who are responsible for the whole platform, including developing web applications and deciding the commission strategy. Their interest includes profit, cost, performances, as well as the sustainability of the whole system. The external stakeholders include customers, advertisers, government with the executive power to make policies. the stock markets is the main market where shares are traded [13].

B. Actors and Goals

The stock market comprises players (actors), who are also the future users of the software/ website in which they can buy or sell the stock [5]. Their goals are to create an account with security credentials and to access their information and portfolio [12].

Integrated system

Integrated systems, such as the yahoo finance, are the systems that provide users investment information about the company or stocks which they are interested in [9]. This is the only system unit that knows the current financial status and statistics about the system. It is the component that is used to retrieve any relevant information of the stock [5].

Database

The database is the system by which stock information is stored and retrieved. The user can view the stock, stock ticker symbols, as well as the user information such as name, trading ID, password, and email address as well as user type. This unit of an organized collection of information is generally stored and can only be accessed electronically. It serves the purpose of pushing information and data back to the viewers comprising all the users and the preceded events. It allows the storage a new incoming data which holds the information about the uses and events [2].

Email Server

This is the machine of the systems that send messages to the investors and lead managers [11]. The messages may be in the form of an email or SMS [8].

System Administrator

This is the person(s) responsible for managing the whole system. The individual interacts with the whole system through the administrator's account. He maintains the whole systems by maintaining personal accounts, contracts, creates databases and manages the players and the platform usage. After creating the database, he is responsible for monitoring interactions of other players, including advertisers and advertising companies within advertisement contracts. The system administrator role requires a person with various key aspects in the following areas:

- Be able to change the entire global system Should
- be at a position to create or to edit the global events
- The site administrator needs to be at a position to view the available statistics of the site [1].

The queuing system

This can be described as a subsystem for scheduling different orders, so that it does not interfere or block other users' interactions. It is used to place and supervise orders that are ready for execution, or even to cancel orders asynchronously. It is also used to schedule events together with mailing for a particular system.

Fully dressed use cases

This indicates that before any user or an individual participates in the terms of site usage, that particular user must be in a position to create and join in the given league [6]. For any particular user within the system, creating a stock market league is very

similar to creating a football league, and due to this fact the two processes are almost similar, and serve the same function in relation to the functionality of the system.

Even though different settings are considered when creating the league, any league manager has the responsibility and mandate to change the league setting and priorities at any time, so long as there is a genuine reason why it is necessary to take place [10]. Most of the systems settings are really comprehensive and consist of items such as privacy of the system, which is the key factor for consideration while designing the system and duration stand for the perfect description, showing how the best setting economy serves.

The main core and purpose of the site is to provide all the users' ability to access the information that is related to the company and its operation, so any user can have the ability to make correct decision based on fact and actual information, as far as the operation of the system is concerned [6]. The site and system administrators will also have the ability to warn, suspend or to even revoke all the users of the system possessions as an abusive activity, and this can include an abusive or aggressive behavior in relation to the league comments or the user messages. It may also entail joining different leagues within the system, and in a real sense when the particular user is not giving out any active participation in almost all groups [17][18].

3. User Interface Specification

The user interface of the Stock Market Investment Fantasy League tends to emphasize the ease of the understanding some graphical representations of the financial metrics which pertains

to the various aspects of the economy and trading in general [10]. Moreover, it is important to note that, adequate space distribution and color harmony should be considered as a priority for providing a pleasant user experience. UI design is established on the top responsive Bootstrap UI framework, and can be chosen for the purpose of demonstrating this concept. The choice is based on its extensive support for the many UI components required in the application [14].

The center of the experience in the Stock Market Investment Fantasy League is attached to the dashboard in which user is allowed to see an overview of their performance in all leagues [15]. Besides, the dashboard provides the users some other features, such as joining new leagues and learning more about finance. There are many primary views, each of which is presented below, see Figure 1. Particular attention is fixed into consistent and uniform user experience. Moreover, each of the views is annotated with an applicable use case to make it easy to determine a proper sequence of views for each use case.

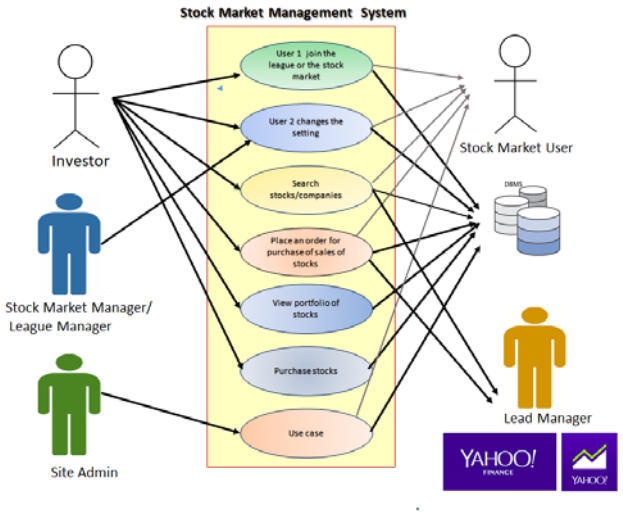

Figure 1: Use Case Diagram

User Effort Estimation

User effort estimation is very important exercise which should be initiated and accomplished in the respect to the requirements of the modern web design [15]. Stock Market Investment Fantasy League are set to make use of a streamlined user interface, which has currently gained significant popularity in designing the web, relating to contemporary modern web design. The interface provides interaction information, which enables membership and usage the various aspects of the system. The interaction is meant to cover aspects such as login and sign-up, as well as the actual interactive activities with the existing fantasy leagues [15][16] [17]. Furthermore, all the league portfolios can be done by making only 10 clicks and 50 keystrokes for the data entry. It is important to note that most of the interactions involved in the process occur during the initial stages of the process of registration.

The interactive activities that are involved began from either registration or login. This is important because a user is required to secure membership into the platform, by signing up and login details for a future login. There are a specific number of clicks required at this stage, in order to ensure that one successfully accomplishes the tasks required at this given point. A user needs to do 2 mouse clicks and 50 keyboard strokes to ensure one accesse of the system. This occurs while the user is expected to accomplish the data entry which covers the selection and entry of sensitive data like the username and password. These are some of the most important requirements for one to be able to have access to the interface in which he or she will have a number of alternative gaming activities and categories to choose from. Furthermore, a CAPTCHA for spambot has a role to play in ensuring that login is controlled and a specific user with a specific identity accesses a given account. A user will have the opportunity to play the leagues guided with some rules which they can bear with. The dashboard is also made in a way that the user periodically gets notified on the progress of the performance in the given leagues [14].

C. Abbreviations and Acronyms
ANN: Artificial neural network
SVM: support vector machine
GA: genetic algorithm
MKL: multiple kernel learning
GA: genetic algorithm

4. System Architecture and System Design

The features of the trading software

The trading software provides access to the specific stock market of their choices for the users worldwide, as well as different liquidity solution. The software needs a search bar for searching, finding, and planning the trades. One of the main needs for traders or players is the user interfaces, therefore, the user interface must be easy to navigate, but also secure [3]. To improve user experiences, the software allows access to the stock market on desktops and smartphones, as well as other handheld devices. The users who are already subscribed and paying have real-time trading alerts, that are automated and allow them to view and switch between various stocks they need [7]. Other features of the stock market software include automated and stock prices, which are streamed and include the quotes. Any trade is recorded and reported in real time with charts and market watchers. The systems

provides an option for multiple exchanges with multiple markets displayed on a single screen [15]

System Architecture and System Design

a) Architectural styles

In this case, the software will combine several architectural styles to optimize the user experiences and improve efficiency, and make it dynamics and interactive [4].

Client/Server- the client's servers will accept the client request and process the input through the server or database. The client's query is returned by the server. The architectural styles are unique, and integrated within a working website, by which a client can log in, trade, view stocks, and manage accounts. The client-server is the backend of the websites [4].

The component-based architecture includes software development approach concerning system design. The design is divided into individual functional component and properties [1]. The components are integrated with the website for seamless communication. The website has modules and they are connected with each other, and with the backend trading software [15].

Event-driven Architectural style

The event-driven architecture is a pattern of software development that relies on the detection feedbacks, in order to trigger the event. The event is any of a state change that can trigger a reaction. In this case, the application works with other actions or events to change state, such as successful login can trigger the display of trades, or in other words ,executing trade can also be trigger by user licking or checking an item [3].

b) Identifying Subsystems

The subsystems in the platform include the entity boundary and control. Each subsystem is characterized by various items or components.

c) Mapping subsystems to hardware

The systems can run on any machine or multiple machines. As this system is a memory intensive software, it is important to consider appropriate hardware system requirements that can handle smooth system functionality.

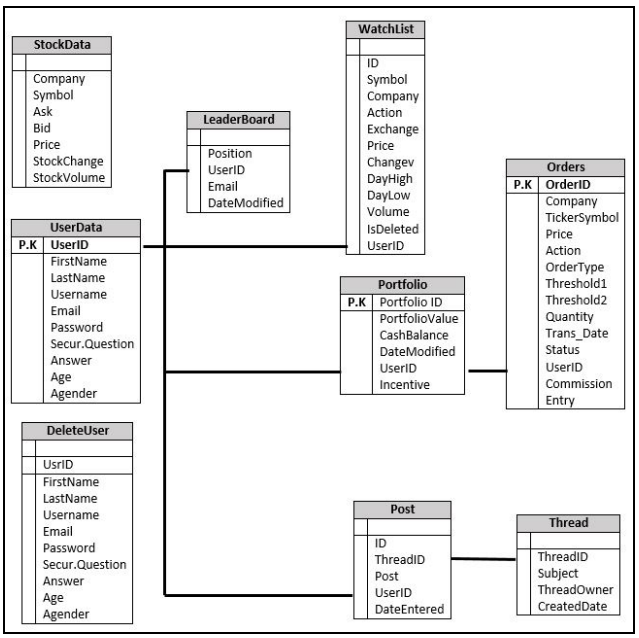

Figure 2: Class Diagram

d) Persistent Data Storage

The systems easily register users who play. All personal information will be stored together along with the user's achievement, their portfolio and trading logs [14][15]. The systems have a relational database such as MYSQL, in which test data are stored in tables and tuples, since user data with its security is a user email and password. The stock information is derived from yahoo finances in real time, and the tables are closely connected with the user ID and email. The emails are linked to the tables, and all updates on tables are linked to specific emails.

e) Network Protocol

The proposed trading systems have a web application that uses the MYSQL which can run on Apache server. The PHP is the built-in library which can communicate with the other databases efficiently. The library will be used for communication between the application and the backend MYSQL database. MYSQL is a free open sources DBMS. The HTTP protocol can also be used because it is currently the standard protocol, acceptable to servers and browsers [15]. The HTTP is also preferred because it allows the users more space for customization and the HTTP Uniform Resource Locator (URL) of all the stock quotes can easily be derived from the yahoo finance.

f) Global Control Flow:

The event-driven systems help improving the execution order, but any event that is triggered would be executed once it is triggered. Any change in the systems is time dependent, since logs are kept for each event and all events are updated concurrently using the enterprise-grade software [15].

g) Hardware Requirements

The hardware recruitment includes the computer processing power and disk storage space. 128mb HDD for the database. OS is windows 7 or later. Internet connection of 56kbps for connection with the yahoo finances.

5. Algorithms and data Structures

(a) Algorithms:

1). Percentage change in share/ stock prices

The algorithm is designed in such way that losers and gainers are listed. The top five gainers and the top five losers are ranked for the investors in order to help selecting the right stock comprising invest in or divest. The percentage of the change in the stock value is calculated and used to rank the companies. The algorithm subtracts the previous share prices from the closing share prices otherwise known as the new share process. The result gotten is the change between the two. The change is useful in enabling investors to select the right stock to invest in. it gives a clear explanation of a company's stock change.

This change is divided afterwards by the pervious share prices, and then multiplied by 100 to fulfill the percentage change.

$$\%change = \frac{P_{new} - P_{previous}}{P_{previous}} \times 100$$

```
//Multiline syntax:
If the changes is higher than 5% [buy the stock]
   [statements ]
[ else if the percentage change < 5% and change >= 0% [ Then hold the stock ]
   [ elseif the change is negative then sell the stock ] ]
[ else hold the stock for one week
   [ elsest and sell ] ]
End If
For the Nested syntax
Module Nested
   Public Sub Main()
      'run the check on all stock to determine their performance.
 Console.checkstock("stock check is " & Checkifstock() & ".")
   End Sub
   Private Function CheckIfstock() As Boolean
 'This determines the current price of the stock at exact time.
Dim PriceD as Price of stock = Price.Date.Time
      Dim hour As Integer =
      'Return true if Monday. 3.20pm or 3.40pm.
  If stockM =Monday hour=3pm then return true
         Else
            Return False
         End If

False
         End If
      Else
         Return False
      End If
   End Function
End Module
```

The algorithm allows the system to check the stock at a specific time. If the time is false, the system checks the stock again or terminates the function.

2). Forecasting stock prices

On the other hand, the stock prices prediction can be conducted using a wide range of statistical techniques including exponential smoothening, moving averages or regression analysis to find the model for predicting the future share prices assuming all other factors are held constant.

Predicting the stock prices changes; the systems can monitor the discussion on the social networks. The changes in the stock prices are predicted better by the social networking services, and other technical indicators. For accurate prediction, the systems will gather investor's sentiments online. MKL and GA can be used to maximize stock prices change prediction model. They both can be integrated into the systems as modules, that use the multiple kernel linear function of various gestures, derived from the sources.

6. Conclusion

The fantasy league projects can be a good model for the stock market, since the dynamics of the fantasy leagues are comparable to the stock market in which prices fluctuate, and risks change. The investment decision made by fantasy league players are also the same as they have to either choose between high-risk investment to the better potential returns, such as low-risk investment with meager returns. The main characteristics of both fantasy league and stock market are risks involved. In this project, the software development combines website portal, software backend with use cases, as well as the database. All actions will be events driven.

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