**Billionaire**

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**Problem Statement**

Stock market has always been a good place for people to do investments. However, stock market also requires deep understanding and knowledge about the market and macro economy trend. Sadly, people tend to jump in market without enough related experiences and knowledges, as an outcome, they lose their money. There are some websites and news articles for the people who are new to the market. But they are all scattered and tutorials are not successive.

**Background Information**

**Targeted Users**

The stock market is in the news every day, and even people who do not personally trade securities or intend to make a fortune by trading stocks have an interest in knowing something about the stock market. By giving students an understanding of the stock market, we are preparing them to deal knowledgeably with an area of our society that has a vast effect on their lives. Whether or not they choose later in life to trade stocks on an individual basis, they will have the knowledge that will enable them to understand this aspect of the economy and how their personal economic pictures are affected by the larger economic landscape.

**Similar Applications**

### Investopedia Stock Simulator

<https://www.investopedia.com/simulator/>

The Investopedia Stock Simulator is well integrated with the site’s familiar educational content. Using real data from the markets, the trading occurs in context of a game, which can involve joining an existing game or the creation of a custom game that allows the user to configure the rules. Options, margin trading, adjustable commission rates and other choices provide a variety of ways to customize the games.

MarketWatch

<https://www.marketwatch.com/vse>

Trade stocks in real-time using your virtual portfolio. Talk strategies with others in the discussion groups for your game. Create a customized public or private game for others to play. Choose a custom list of symbols to trade in your game.

**Limitations**

***Breed complacency***

Perhaps the biggest danger of a stock simulator is that it may lull a novice trader into a false sense of complacency if he or she has had a hot streak of several successful virtual trades. As any trader will attest, real life trading poses several challenges–some of which are detailed below–that are not part of the virtual trading environment. As a result, trading outcomes in the real world can differ very significantly from the results of simulated trading.

***Unrealistic trades***

Stock simulators have become increasingly sophisticated in terms of their offerings, and a number of them come close to replicating the real-life experience of trading. But most simulators do not offer a real-time trading environment with live prices. This can be a significant handicap, as trading decisions made on the basis of live prices can be markedly different from those made with the benefit of a 15-20 minute lag that is a common feature in simulated stock trading programs. The prices obtained for opening and closing positions in a stock simulator may also be quite different from those obtained in the real world.

***Risky strategies***

Since there is no actual capital at stake, a stock simulator may foster excessive risk taking and form trading habits that become difficult to shake off in the real world. Strategies like short sales, momentum trading, and the use of leverage need a certain degree of expertise because of their higher degree of risk. These strategies may appear easier in the simulated stock environment than they are in the real world.

**Requirements**

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| --- | --- |
| **Backlog ID** | **Functional Requirements** |
| *Profile Page* | |
| **1.** | As a user, I would like to create a new account. |
| **2.** | As a user, I would like to reset my password via email if I do not remember the original one. |
| **3.** | As a user, I would like to modify my password. |
| **4.** | As a user, I would like to get free virtual cash once I create an account. |
| **5.** | As a user, I would like to gain some free virtual cash (wage) for logging onto the page consecutively for a week. |
| **6.** | As a user, I would like to view the total coins that I have. |
| **7.** | (If time allows) As a user, I would like to log in with my facebook or any other social media account without creating a new account. |
| *Stock Page* | |
| **8.** | As a user, I would like to search the stock |
| **9.** | As a user, I would like to add my search stock into my watchlist after I login |
| **10.** | As a user, I would like to see the stock chart pattern for the stock that I searched |
| **11.** | As a user, I would like to check out the related news articles for the stock that I searched |
| **12.** | As a user, I would like to jump to the Game trading page to trade my search stock |
| *Game Page* | |
| **13.** | As a user, I would like to see my total game capital for the game. |
| **14.** | As a user, I would like to see the stocks I have bought and how much they worth. |
| **15.** | As a user, I would like to search stock information in the game page |
| **16.** | As a user, I would like to see the most active stocks by volume list on my game page. |
| **17.** | As a user, I would like to see a recent trading history |
| **18.** | As a user, I would like to see what stocks I have in my watchlist |
| **19.** | As a user, I would like to go directly to the stock page from the watchlist |
| **20.** | As a user, I would like to remove the stocks from the watchlist |
| **21.** | As a user, I would like to set values in the notification setting for the stocks in my watchlist |
| **22.** | As a user, I would like to receive emails if the price of the stocks in my watchlist drops or goes up |
| **23.** | As a user, I would like to see my rank among players. (If time allowed) |
| *Trading Page* | |
| **24.** | As a user, I would like to see all of my trading history |
| **25.** | As a user, I would like to place an order on the stock |
| **26.** | As a user, I would like to see my account value in the game trading page |
| **27.** | As a user, I would like to preview the order I placed |
| **28.** | As a user, I would like to know if the order I placed failed or not |
| *Main Page* | |
| **29.** | As a user, I would like to search a specific stock on the main page. |
| **30.** | As a user, I would like to see rolling news summary in current stock market |
| **31.** | As a user, I would like to login my account from the main page. |
| **32.** | As a user, I would like to logout from my account |
| **33.** | As a user, I would like to see pictures of rolling news |
| **34.** | As a user, I would like to login with facebook from the main page |
| *Tutorial Page* | |
| **35.** | As a user, I would like to study basic of stock market |
| **36.** | As a user, I would like to know how to buy stock and sell stock |
| **37.** | As a user, I would like to see basic stock concepts and strategies |
| **38.** | As a user, I would like to know how to play the game |
| *Miscellaneous* | |
| **39.** | As a user, I would like to know who made the website. |
| **40.** | As a user, I would like to fill in the feedback form to developers. |
| **41.** | As a user, I would like to know the passing percentage of each course for last semester. |
| **42.** | As a user, I would like to see the introduction about the website main purpose on the front page. |

**Non-Functional Requirements**

**Usability Requirements**

A clear instruction of the application will be send to the user once they created their account. Most of the functions are clear to users without instruction, such as search for the stock, add stock into watch list, sell and buy the stock. Different web page design will be created for various application requirement. They will login page which allows users to get into their personal profile page on the website. Personal profile page will display amount of money they have, and their recent trading history. Main feature of the application will be designed for stock game, trading, watchlist, and trading tutorial. Using of the application is clear and easy to understand. Application also can be view and used on various devices and browsers.

**Security**

Security will be an important part for this application since most part of User’s information is shall not be share to other, except their account amount. Since Node.js will be our framework, different security protection will be used based on Node.js functions. On the frontend, cookie theft will be prevented by setting the HttpOnly flag on cookies. Content\_security\_Policy header will be used for content security. For Cross-site Request Forgery addition hidden input with the CSRF token value will be added to user inform in order to protect the system. For the backend mostly for data securities, reflected cross site scripting and stored cross site scripting will be used for XSS data validation. SQL injection will be prevented in Node.js node-postgres module. User’s inputs are always filtered and sanitized to kill the command injection. Last part of the security check will be transmitted between frontend and backend. Nmap and Slyze will be used to test the SSL/TLS tunnels.

**Documentation**

We must provide documentation to the user on how the web application should be used. This will be included in the tutorial section which will guide the users how to play the game.

**Performance**

All the pages should load in a reasonable amount of time. For the game part, the trade and sell should be immediate. For the search function, the search result will be displayed with a latency of no more than 5 seconds. If users forget the password and request a password reset, the email of resetting will be sent with a latency of no more than 1 hour. If there is a new trading created, the action will be updated instantly after users submit their order. Trading confirmation through the pop-up window will be delivered with a time delay of no more than 3 seconds.

**Scalability**

As more and more users register on the website, the web database will be able to increase its total output under an increased load when resources (typically hardware) are added. The system should process to handle a growing amount of work, or have the potential ability to be enlarged in order to accommodate that data growth. If there are a large number of things n that affect scaling, then resource requirements must grow less than *n2* as n increases. In addition, the system should also guarantee data security and other properties.