Software Requirements Specification

for

CommunistBadgers

Version 1.0

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Revision History

Name	Date	Reason For Changes	Version

1. Introduction

1.1 Purpose

The Goal of this product, CommunistBadgers, is to provide users with a platform where they can see stocks of different companies and can check live trends of where the stock market is going. The successful prediction of a stock's future price could yield significant profit.

1.2 Document Conventions

Main Section Titles

- Font: Arial
- Face: Bold
- Size: 18

Sub Section Titles

- Font: Arial
- Face: Bold
- Size: 14

Other Subsection Titles

- Font: Arial
- Face: Bold & Italic
- Size: 12

Other Text Explanations

- Font: Arial
- Face: Normal
- Size: 11

1.3 Intended Audience and Reading Suggestions

Our ***Clients*** (can only view the product and search for stuff) are:

- Stock Brokers
- Financial Advisors
- Tax Inspectors / Officers
- Traders
- Public Relations (PR) Agencies

Our ***Admins*** (can edit, add records) are:

- Developers (us)
- Data Gatherers

Reading Suggestions: The readers should have a basic knowledge of how Stocks work and should also know what factors (Disasters, Political Actions (our product Judges them by Tweets based on location)) affect stock market of a country.

1.4 Product Scope

In this epoch of *modern capitalism*, high-frequency trading has been an inevitable part of traders lined up at Wall Street. It becomes increasingly difficult and frustrating to monitor the fluctuations in the markets as the trend tends to get 'shaky' even with a little political upheaval in the country. CommunistBadgers helps in trading by providing graphs and based on past stock trends and Political stunts by companies and other factors which might affect the stock prices of a company. Tweets provide us a good idea of how the actions of people will affect the stocks. CommunistBadgers is an open-source Software which will be available for people to download on GitHub.

1.5 References

SRS References

- Krazy Tech
- VCE IT
- Belitsoft

Stock Market Explanation

- https://www.youtube.com/watch?v=F3QpgXBtDeo
- https://www.youtube.com/watch?v=_-dD416-cqw
- https://www.youtube.com/watch?v=l3t406oTmss

Stock Prediction

- Hackernoon - Medium

Others

- https://pythontips.com/2013/07/30/20-python-libraries-you-cant-live-without/

2. Overall Description

2.1 Product Perspective

The Server will take data (Tweets, News Information, Stock Prices over time of a Company) from the internet automatically, and then put it through our Stock Prediction Model, and the Server then generates the Stock Prices and Graphs for the User/Client to view in a GUI based software.

2.2 Product Functions

The Server Gathers data from the internet, which can be in the form of Tweets, News Articles, Political Speeches etc. and then calculates Negative Index of a stock and then based on the Indices of different Stocks the Model suggests the client Stock Entity which is expected to rise. Then there is a Search functionality for the client to search for a particular stock and graphs and trends are shown on a simple GUI based interface.

2.3 User Classes and Characteristics

Client Users: There is only one user class in this product and they are the clients and their jobs are to search for a specific stock or look at the Stock Market from a zoomed out view, i.e. which Stocks are stable for the client to invest money in.

2.4 Operating Environment

The Software will be okay to operate on a low-end processor like the Intel Pentium 4 Processor, 256MB of RAM, 40GB of Hard Disk Storage (Not that it matters a lot in the first place) because the Software isn't resource hungry at the user/client end, The Server however is expected to be quite powerful, Intel Core i7-6700HQ or Intel Core i7-7700HQ with 8 to 16 GB of RAM (More RAM is always good for Machine Learning Tasks), 100GB of Hard Disk Storage (Again, it does not matter much) running Ubuntu (Linux) with a Dedicated Graphics Card like Nvidia GTX 1050, *TensorFlow* and *Python* are required for this to run on the server side.

2.5 Design and Implementation Constraints

The Client Machine must have *Python - Version 3.6 or above* installed on their *Ubuntu - Version 16.01 or above* on their machines. There is no need for the client to have TensorFlow installed. The Following Python libraries should be installed in the client's machine: Numpy, Matplotlib, SQLAlchemy, wxPython. The GNUPlot software should be installed on the Linux machine in order to view the graphs and the Stock trends.

2.6 User Documentation

There is no User Documentation available at the moment because the product is still in the development phase and it does not ship with User Documentation.

2.7 Assumptions and Dependencies

- Server (and Client) must run on Ubuntu Linux
- Internet connection is needed, for database updating - Server Side
- Client is comfortable with the Linux Command Line Terminal
- Client knows how to run python programs
- Client has a knowledge about databases
- The Client has proper browser installed for database tools
- The Client machine must have text editors for viewing files.

3. External Interface Requirements

3.1 User Interfaces

There will be a main home screen which will show the hot stocks of today and will be sorted based on their prices and growth. Then there will be a Search bar on the screen which lets the user search for specific stocks There is a window which shows the matching results based on their closeness to the actual query. When the stocks records are loaded the software shows the stock prices and tells if there had been a growth or a decline in the stock, today, and there is a button saying, “view graph”, which when clicked opens up the graph in a GNUPlot window showing the trend of that stock.

3.2 Hardware Interfaces

This Product will only be available to users with Laptops or Desktop Workstations. Ethernet Protocol is used for Interfacing these devices and Wi-Fi for Wireless Communication for these devices. For Databases, Client will access the databases in Read only mode.

3.3 Software Interfaces

The first and foremost thing to have is *Python - Version 3.6 or above* on an *Ubuntu - Version 16.01 or above* machine. One of the most important interfaces in this product is TensorFlow and it can be installed using Python Pip installer. TensorFlow is a library used to interface with the hardware (GPU) and is very powerful if used for parallel operations, like matrix multiplication and NumPy must be used in conjunction with TensorFlow. For Data Plotting on Graphs Matplotlib is used. Matplotlib actually is an interface between Python and GNUPlot, which is a plotting software for Linux Operating Systems. For the Database interface SQLAlchemy is to be used, it is criticized for its rigidity but is a powerful tool nonetheless. Then there is a GUI, Graphical User Interface, Library in Python called wxPython, which is a wrapper for the cross-platform GUI API wxWidgets, which uses C++ to make objects required in the GUI Based application, it in fact is written in C++. All of these Interfaces mentioned above are Open-source and can be easily downloaded by forking them from GitHub or just downloading them using the Python’s default Downloader, PIP.

3.4 Communications Interfaces

SQLAlchemy is a Python Library which provides the interface to Databases. There is HTTP communication Protocol in play if there is a remote Database, which should be viewed in the Web Browser.

4. System Features

4.1 Account Based System

4.1.1 Description and Priority

Using this feature, client and admin accounts will be created. Both can login to the system at any time to use its feature or monitor it. This is a high priority feature as each client can manage their

personal preferences and use the software to their liking. On the other hand, it will provide a secure and efficient way to use and manage the whole system.

4.1.2 Stimulus/Response Sequences

This feature can be access by clicking the “New Registration” button. This will take the user to a new page which will ask the user to fill a form with the following details:

- Account Type
- Full Name
- Username
- Email Address
- Strong Password
- Date of Birth

After submitting the form, the account will be created after email is verified. New admin accounts will require approval from existing admins. Users can use the software by clicking the “Login” button and entering the following details:

- Email or username
- Password

4.1.3 Functional Requirements

REQ-1: User’s full name should be alphabets and spaces only. There should not be any number, other symbolic ASCII characters, non-ASCII characters etc.

REQ-2: Username should be alphabets, underscore and numbers only. There should not be any other symbolic ASCII characters, spaces, non-ASCII characters etc.

REQ-3: Email address should be of correct format and must be verifiable.

REQ-4: Password should contain uppercase and small letters, numbers and alphanumeric character.

REQ-5: Password length should be more than eight characters.

4.2 Stock Rates Graph

4.2.1 Description and Priority

This is high priority feature. Our whole system is to run on stock rates. Instead of showing a lot of numbers in front of the user, the software will display a graph. The graph will give an overview of stock rate and its change of a company.

4.2.2 Stimulus/Response Sequences

This feature can be access by clicking the “View Graph” button. This will take the user to a new page which will ask the user to select a company from a list and time range. After that, a graph will be displayed to the user.

User can click on the graph to get exact values.

4.2.3 Functional Requirements

REQ-1: The computer running the software should have an Internet connection and the software be allowed to use it, to get the real-time data from external sources.

REQ-2: A company should be selected.

4.3 Company Subscription

4.3.1 Description and Priority

This feature is of medium priority. This will allow the user to subscribe to a company to get notified of major change in its stock value.

4.3.2 Stimulus/Response Sequences

This feature can be access by using the “Search” functionality. This will take the user to a new page which will contain list of companies matching the search. The user can then subscribe by clicking the subscribe button.
The user can also select “Get Weekly Report”, to get weekly report of stock of that company.

4.3.3 Functional Requirements

REQ-1: The computer running the software should have an Internet connection and the software be allowed to use it, to get the real-time data from external sources.

4.4 Report Creation

4.4.1 Description and Priority

This feature is of low priority. This will allow the user to download a report of company(s) performance over a select range of time.

4.4.2 Stimulus/Response Sequences

This feature can be invoked by clicking the “Get Report” button on the dashboard. This will take the user to a new page which will contain list of companies where user can search. The user also needs to select start and end date from two date field.

4.4.3 Functional Requirements

REQ-1: The computer running the software should have an Internet connection and the software be allowed to use it, to get the data from the server.
REQ-2: At least one company should be selected.
REQ-3: Time range for the report should be more than a week.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

REQ-1: The software should always have stable internet connectivity.
REQ-2: User’s computer should have basic file reading software to read PDFs and other logs.

5.2 Safety Requirements

As the software does not store personal and financial information of the user, there is no safety concern caused by the use of CommunistBadgers.

5.3 Security Requirements

REQ-1: User should choose a very strong and unpredictable password.
REQ-2: Passwords should be encrypted before storing them in database.
REQ-3: User account creation should be verified through given email.
REQ-4: Admin account creation should be verified manually be existing admins.
REQ-5: Software should only be used after logging in.
REQ-6: Client Server communication should be done using secured connection types.

5.4 Software Quality Attributes

5.4.1 Correctness

Processing algorithm should work correctly.
User profiles should be kept separate from each other so that users should see content based on their preferences.

5.4.2 Availability

The server should always remain responsive to handle client queries on the go. The down time should not exceed 1 second.

5.4.3 Maintainability

All the history, phases, and decision making in the development should be kept in documentation and software version management.

5.4.4 Portability

The client version will be developed in Python programming language to make sure it runs on any environment. Server, however, should be run only on Ubuntu because of TensorFlow issues.

5.4.5 Usability

The client side should be developed with GUI to make sure it is easy to use, and user does not have to memorize commands as in CLI based system.
The interface items should be separated and easily visible.
The interface should be designed in a way that similar functions are placed together to support learnability.

5.5 Business Rules

CommunistBadgers is not used to trade stocks, so it does not lie under any business or legal rules. It is merely an assistant to help traders make better decisions.

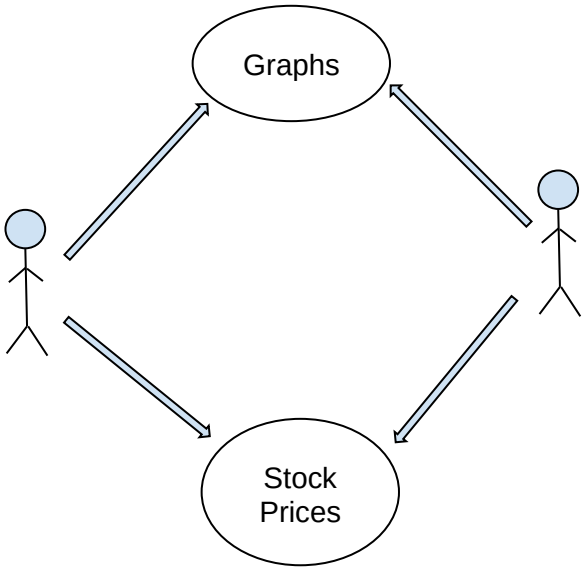
Appendix A: Glossary

Terms	Full forms
PR	Public Relations
GUI	Graphical User Interface
SRS	Software Requirement Specification
GPU	Graphics Processing Unit
SQL	Structured Query Language
GNU	GNU's Not Unix (recursive)

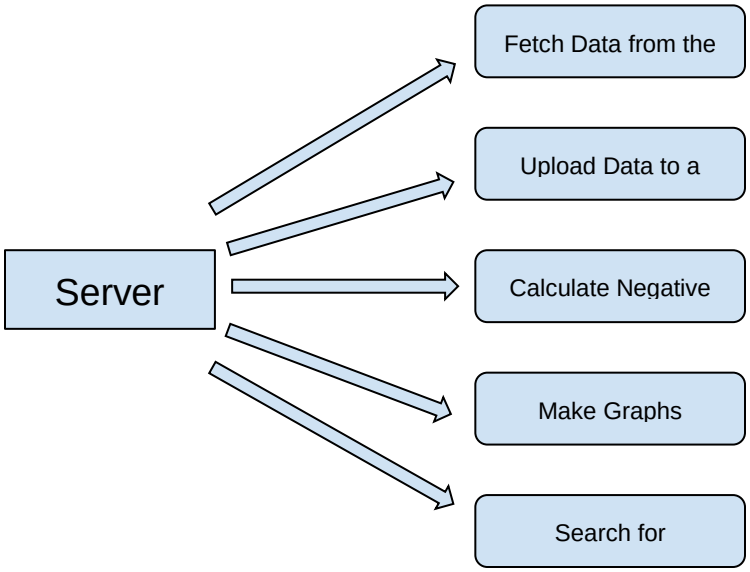
API	Application Program Interface
HTTP	Hypertext Transfer Protocol
ASCII	American Standard Code for Information Interchange
PDF	Portable Document Format
CLI	Command Line Interface

Appendix B: Analysis Models

Product Perspective



Product Functions



Appendix C: Examples

NetSol Technologies Inc.
NASDAQ: NTWK

+ Follow

8.98 USD −0.020 (0.22%)
Closed: 30 Oct, 7:37 PM GMT-4 · Disclaimer
After hours 9.04 +0.060 (0.67%)

1 day | 5 days | 1 month | 6 months | YTD | 1 year | 5 years | Max

Open	9.00	Div yield	-
High	9.40	Prev close	9.00
Low	8.65	52-wk high	9.40
Mkt cap	103.29M	52-wk low	3.08
P/E ratio	23.59		