Financial Markets Analyzer and Predictor

Software Requirement Specification

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# Introduction

## Purpose

This Software Requirement Specification is written for the '**Financial Markets Analyzer and Predictor.'** It is a stand-alone product. The document is written for the purpose of helping the users and audience understand the document better.Hereafter, the document would also refer to the software as '**FMAP**.'

## Document Conventions

The SRS follows standard conventions as per industry standards. Necessary clarifications are made wherever necessary to help the reader understand any aspect of the product.

## Intended Audience and Reading Suggestions

The SRS is meant for all types of people and computer enthusiasts who want a deeper insight into the product and understand the idea that went behind creating the product. Despite our best efforts to keep it as simple as possible, the reader is expected to be familiar with basic concepts and terminologies used in financial markets and software industry to understand the document better.

## Product Scope

The FMAP, or Financial Market Analyzer and Predictor is being created as part of the Third-Year undergraduate project. The financial markets are one of the most volatile and unpredictable set of events. As such, any effort to try to understand them better and get an insight on how they function can prove beneficial to people involved in the financial sector. The product is being developed as a business product. With the advent of fast computers and Internet connection, it is possible to do real-time analysis of stocks for investors. Using existing technologies in Machine Learning, Neural Networks and Web Infrastructure, an easy-to-use product that provides analysis would be very popular and profitable.

# Overall Description

## Product Perspective

The FMAP is based on the idea of using mathematics, computing and artificial intelligence (machine learning) to create a meaningful product. While there are many applications of these existing technologies, nothing seems exciting than the world of financial markets. While humans are unable to compute the direction market takes, the FMAP tries to improve on methods devised by humans and make better analysis and in some cases predictions regarding what directions investors should be taken. However, we would again like to emphasize that the product is being developed from an educational standpoint.

## Product Functions

* Provide users with an easy to use interface to use the product
* Allow users to choose specific financial market and its corresponding stocks, options
* Look at the historic data of a specific market or stock and allow the product to predict its movement in the given time frame
* Compare the real-life movement, the prediction of the FMAP and provide analysis on its basis

## User Classes and Characteristics

We expect the primary users of product to be the people interested in the financial markets including investment bankers, casual or retail investors and others who would want to invest in stocks.

## Operating Environment

The product would be developed in two parts – client and server side. Any user with a modern browser and decent Internet connection can use the product. The client would not interact with the server directly.

## Design and Implementation Constraints

There are no restrictions on implementation. We will be trying to use open source components which users will be free to modify or use. Use of real time data would require premium API.

## Assumptions and Dependencies

With the pace with which new components are developed, it would be difficult to pick the exact products FMAP will require but it would primarily need Python based machine learning libraries. We will be using open source libraries and frameworks to implement the machine learning algorithms. For showing the results of our ML algorithms, we will primarily use Python and R. Whereas, HTML, CSS, JavaScript would be used to render client side. Any additional library or service would be installed server side and user would have no need to install any external software.

# External Interface Requirements

## User Interfaces

The user interface is quite simple and intuitive. The client side would consist of a web app with Login module and the actual app. The actual app would consist of a main prediction page which would host charts, various tools(zoom, selector, time slot selector) and other parameters. The app would also include other pages like About, Contact and Settings.

## Hardware Interfaces

Since the product works on a standard computer, it would use all the normal hardware interactions available to the software on any computer. While most of the data would be on the server itself, it will require a fast Internet connection for best functionality.

RAM : 6 GB

Storage

Client – 20 MB of disk space

Server – 1 GB of disk space

Network – >1Mbps and latency <50ms

## Software Interfaces

The software does not require any data from other components installed on the computer or from the operating system. It operates independently on the data it has been provided with.

## Communications Interfaces

The product would require a browser and HTTP protocols to communicate and fetch data.

Since the product requires communication between server and client, a fast Internet connection is desired. The product can do minute-by minute prediction for which a Internet connection with small latency is desired(around 50-60ms).

# System Features

## Predict Future Movement

### Description and Priority

This feature would try to predict the future movement of any stock or market user selects along with the time frame he/she provides.

### Stimulus/Response Sequences

The system would take the input and produce a graph or chart to visually depict its analysis and predictions. The graphs would be produced on the basis of machine learning algorithms and data science methods used to work on the data.

### Functional Requirements

Since this is a stand-alone product, the only requirement is to have a browser that can support JavaScript and major libraries. Also the user should have a good Internet connection to communicate with the server.

## Accuracy Tracker

### Description and Priority

The feature would allow the user to see the performance of the FMAP against the real-life movement of the stock. It would also rate its performance and show the user the accuracy it achieved.

### Stimulus/Response Sequences

The product would trigger this feature on the users' discretion and produce a pop-up with accuracy and produce charts with complementing aspects – the real movement and the predicted movement.

### Functional Requirements

Since this is a stand-alone product on web, the only requirement is to have the product itself.

# Other Nonfunctional Requirements

## Safety Requirements

The product produces nothing to indict the user with illegal activity.

## Security Requirements

The data received from the server should be encrypted to prevent the mishandling, corrupting of data which in hindsight would give inaccurate results.

Since the product works with freely available data, there is nothing confidential the user must submit or provide the product.