

# Requirements Specification



## Stock Probability Illustration

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Customer: Fishback Management

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# 1.0 Introduction

## *1.1 Project Overview*

The purpose of this project is to provide a simple user interface that visually represents and accurately predicts future stock market values for those that may not be familiar with stocks . Not everyone has the time or skill to analyze stock market values and come to proper conclusions on how they should invest their money.

## *1.2 Project Scope*

Our application will be an elaboration on a current web application designed by Fishback Management, which currently displays the volatility of stocks graphically based on user selection of the stock that they would like to preview. Our addition to the application will be designed to give the user the ability to select a custom volatility and time, and subsequently display a graphical representation of the time series as well as a prediction of the future probability of the stock based on calculations from the user's input. The main constraints of the project are that the application is only able to display in one month increments and can only predict up to six months of data.

## *1.3 Document Preview*

The purpose of this document is to provide a detailed overview of the web application. It will describe the intended use and features of the application, what it will produce visually, and the constraints . This document is intended for the customer, Fishback Management.

# 2.0 Project Overview

The real-world problem that we are tasked with solving is essentially calculating and predicting data in a user-friendly environment that displays as a web application. We will be creating an algorithm that will calculate probabilities and volatilities within specific periods of time.

Fishback Management's current application allows a user to select a stock, and then displays the stock volatility graphically. With this current system, there is no option for the user to view a prediction of future stock values. Our solution to this issue is to allow the user to select a custom volatility and time, and then display the probability of future stock values graphically based on calculations from the input. We plan to implement this within the current environment. Developing this within the current framework will not only reduce costs and increase efficiency, but will protect

current users of the application from inconvenience. Becoming familiar with a new system can be confusing and difficult to adjust to.

The main feature of this system is the ability to build a probability cone that pulls from real-world stock data, of which is manipulated by volatility and time.

Some constraints that may influence the design are that the data may not always be accurate, a lot of code has already been built and cannot be changed by us, the servers may go down for an unknown period of time, and that most of our group are not familiar with the languages required. Our customer is Fishback Management, and the intended users of the system are the customers using Fishback Management's ODDS software to obtain information on the stocks that they are interested in.

## 3.0 Development and Target Environments

This section describes the software resources necessary to build and run the system. We will be developing in a Linux subsystem in order to SSH into a server. We are doing this to be able to code with SQL, PHP, and HTML5. This will all interface with an external system, Highcharts, in order to display our calculated data.

## 4.0 System Model

This section will present the components of the existing system and the proposed system. The existing system can be described as an application that lives in the web and display graphics, calculated from data provided from the server. The proposed system will also live in the web and display graphics, however, it will pull data from the user to predict future values.

## 5.0 User Interaction

From the point of view of the user, the program loads and displays the graph of the time series of stocks, prices, volatility, closing price, probability, dates, and monthly increments in standard deviation. The user will be able to use custom volatility to display the new input after being recalculated.

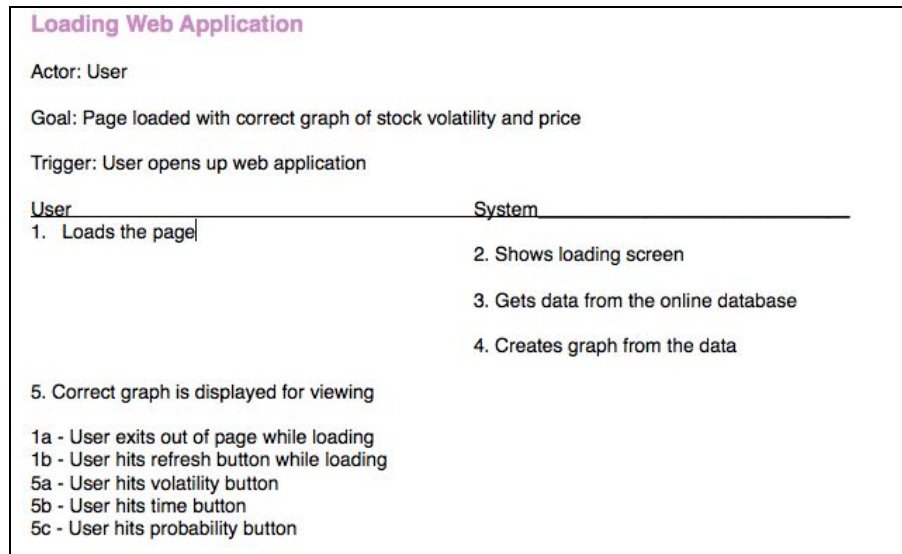


Figure 5.1

Use case diagram for loading the web application

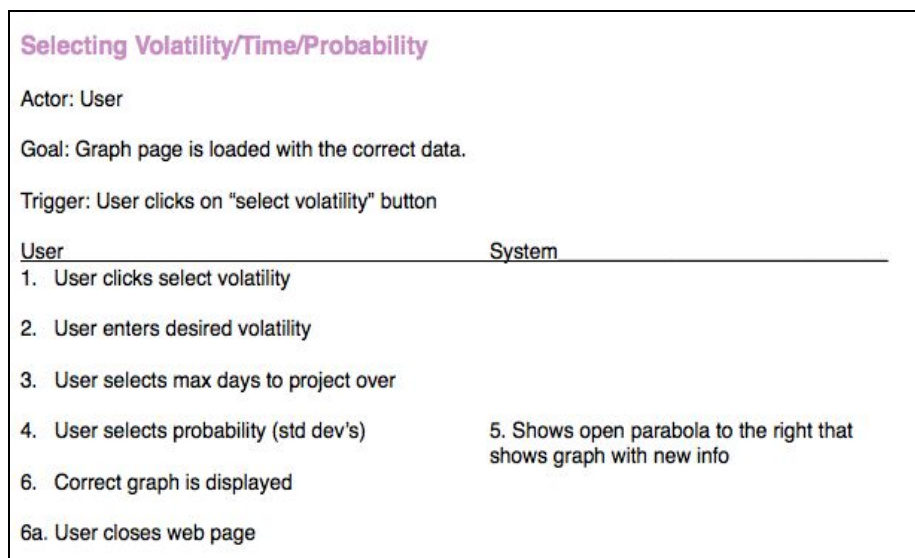


Figure 5.2

Use case diagram for selecting the volatility, time, and probability

## 6.0 Functional Requirements

This section outlines in detail the functional requirements of the system.

### 6.1 Loading web application

#### Brief Description

The website application loads and asks the user to select a stock to view

#### **Step-by-Step Description**

1. The website loads the page
  - a. The user exits out of the page while it is loading.
  - b. The user hits the refresh button while the page is loading.
2. The website shows the loading screen
3. The website prompts the user to select a stock
4. The user selects the desired stock

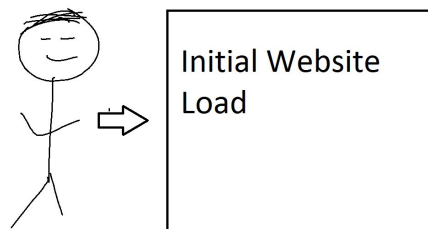


Figure 6.1

## **6.2 *Displaying graph***

#### **Brief Description**

The website displays the volatility and closing price of a stock in a graph form

#### **Step-by-Step Description**

1. The website loads the page
  - c. The user exits out of the page while it is loading.
  - d. The user hits the refresh button while the page is loading.
2. The website shows the loading screen
3. The website gets data from the online database
4. The website creates a graph from the data
5. Correct graph is displayed for viewing
  - a. The user hits the volatility button.
  - b. The user hits the time button.
  - c. The user hits the probability button.

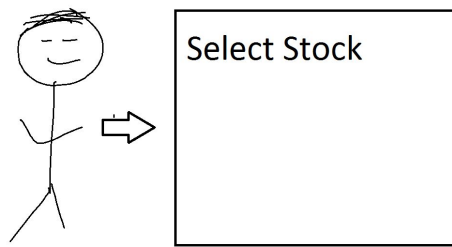


Figure 6.2

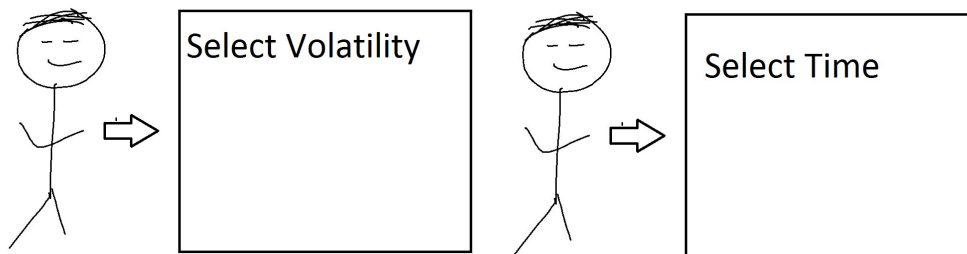
## 6.3 *Selecting volatility and time*

### **Brief Description**

The website permits the user to select a custom stock volatility and time.

### **Step-by-Step Description**

1. The user clicks select volatility
2. The user enters the desired volatility
3. The user selects the max days to project over
4. The user selects the probability (standard deviations)



Figures 6.3.1, 6.3.2

## 6.4 *Displaying probability graph*

### **Brief Description**

The website predicts future values based on user-given and real-world data, and displays this on the graph.

### **Step-by-Step Description**

1. The web page produces standard deviations and other resource-intensive calculations
2. The web page shows an open parabola to the right that shows the graph with the new info
3. The correct graph is displayed

- a. The user closes the web page

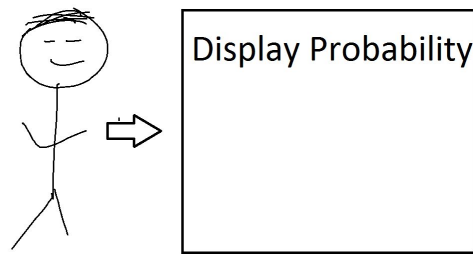


Figure 6.4

## 7.0 Nonfunctional Requirements

This section outlines the constraints under which the web application must operate. The loaded webpage elements must work in all modern internet browsers, including mobile phone browsers. Because the web pages must load mobily, we must be wary of our usage of memory. The web pages must also work in a timely manner and should not appear to “hang” to the user. The web page must not return an internal server error and crash. All possible user interactions must be accounted for. Having the web page load and be usable on all browsers is of the highest priority and non negotiable. Not appearing to hang is incredibly important, but won’t ruin the program if it takes 6 seconds to load.

## 8.0 Feasibility

The project that we have been asked to do has a very narrow set of design requirements. Because of this there isn’t that much of a difference between what would be the minimum design specification and what the full design specification is.

The bare bones version of our project would be if we only implemented the calculations and graphing, while the enhanced version would include user input.

## 9.0 Conclusion

In conclusion, our system will include a feasible, functional application that is user friendly enough for end users to navigate and provide input. This application will be visually appealing and the graphical interface will be easy to understand. The data provided by this application should predict a stock’s future value.



# 10.0 Appendices

## Appendix a:

Figure 5.1 Use Case, Web Page Loading

## Appendix b:

Figure 5.2 Use Case, Selecting Options

## Appendix c:

Figure 6.1 Initial Website Load

## Appendix d:

Figure 6.2 Select Stock

## Appendix e:

Figure 6.3.1 Select Volatility

Figure 6.3.2 Select Time

## Appendix f:

Figure 6.4 Display Probability