DEPARTMENT OF COMPUTER SCIENCE

NORTH CAROLINA A&T STATE UNIVERSITY

PROJECT CHARTER

COMP 496: SENIOR DESIGN II

SPRING 2020

FINANCE GOONS

"INVEST THE BEST"

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REVISION HISTORY

Revision	Date	Author(s)	Description
0.1	02/17/2020	KDS	document creation
1.0	02/18/2020	KAS, KDS, MDC, JNA	initial release
1.1	05/04/2020	KAS, KDS, MDC, JNA	Final release

CONTENTS

1 VISION

The purpose of the project is to be able to current stock prices and the past trends that occurred to predict how they might change in the future. It is to also present them in a nice and easy to understand way.

2 MISSION

First, we need to acquire the past data to use to predict what will happen. Then run it through an algorithm to predict where the trend will go. Then it will be given to the server to be displayed on the website that will show the different companies stock prices and trends.

3 SUCCESS CRITERIA

Upon completion of the system, we expect the following steps to be done:
- The server will be running, and the data of each company will be showing
- The website will be polished and look nice
- The time for prediction will be faster

Within 6 months after the delivery date, we expect the following steps to be done:
- A further reduction in time to be as minimal as possible for predicting
- The change in prediction will show in real time
- An additional reduction in operating costs

Within 12 months after the delivery date, we expect the following steps to be done:
- Expansion of the system to cover a more variety of companies
- Porting of the system to additional platforms, like an app or to a web server
- An additional reduction in operating costs

4 BACKGROUND

The main problem that we have to address in our project is a way to get investors interested in a different alternative to purchasing, selling, trading, and knowledge about the stocks. Some of these investors have trouble getting into stocks because they are not familiar with how the stock market works or are not sure which company, they want to invest in fear of losing money when they invest in that company. With our project, Invest the Best, investors will be able to use a website to be able to assist them in choosing which companies are the best to start investing stocks in.

Our solution to the problem is for our project tackles is creating a website that is able to display the stock prices for the companies that are shown on the website. The website will also allow the user to see the changes in the stock price on a half an hour basis. The website will also show the user a prediction of the rise and fall of the stock prices. The user will also have the opportunity to create an account on the website so that they are able to purchase stocks.

Because there are many people in America that invest in stocks. We believe that this website would be a great entry way for people to get interested in investing in the stock market. The reason we to do this project is because there are people that want to start investing in stocks, however people have no idea how to invest in stocks.

We believe that this project will allow investors to have the chance to purchase stocks. It will also be a good entry point for people to learn about the stock market so that people can start investing in companies.

5 RELATED WORK

Some solutions that we need to have for our product is to make sure the website is user friendly, so that people, who have various skill sets in working in stocks will be able to use this website in its entirety. The website's functionality will be important for the investors that come use the website. The website simplicity will ensure that investors of various technical skills, that they can navigate the website with relative ease and be able to understand what the information that is being displayed by the website.

During our research, we have discovered an API that we plan to use to acquire the information required to display the stock price for the companies that our website plans to use for investors to check the stock prices. Our research has also found a method to implement the login feature that we plan to use for our website so that users can create an account. We also gained access to web server to host the website so the AI and database can implement together to provide the data that we need for our website to implemented in.

Some problems that we could face is the AI that we are using might not be able to update the users on the current stock market or be able to predict how the stock prices will rise or fall inaccurately. This could cause a lack of information given to the users so they will not be able to figure what stocks they want to invest and which stocks they want to remove their investment from.

If our website is successful enough when it finished and works with very few problems, we are considering making the website available for commercial use, so citizens how are interested in investing in stocks.

6 SYSTEM OVERVIEW

Our solution to the problem is to create a website that will allow users to companies and stock prices and be able to see the predicted rise and fall of those prices throughout the day, so that users can figure out which companies they would like to invest in. The design of our website will be simple and easy for everyone to use. People who buy stocks regularly can use this website to gain more information about the companies that they have stocks in and people who are starting to get into stocks will be able to use our website for more knowledge in what stocks to look into so that they have a better chance of getting some money from companies. The website will also include a log system where user give their information and be able to register for the website. The website that we are building will include many implementations along with it. We are using an AI, database and webserver for the technical aspect behind the website. The AI will take the data of the prices from each of the companies and be able to show how the stocks prices will either rise or fall within the next 24 hours. The database will contain data and stock prices for each of the companies so the AI can read the database and be able to predict how the stock prices will change in the next day, so investors are able to think about what stocks they want to buy.
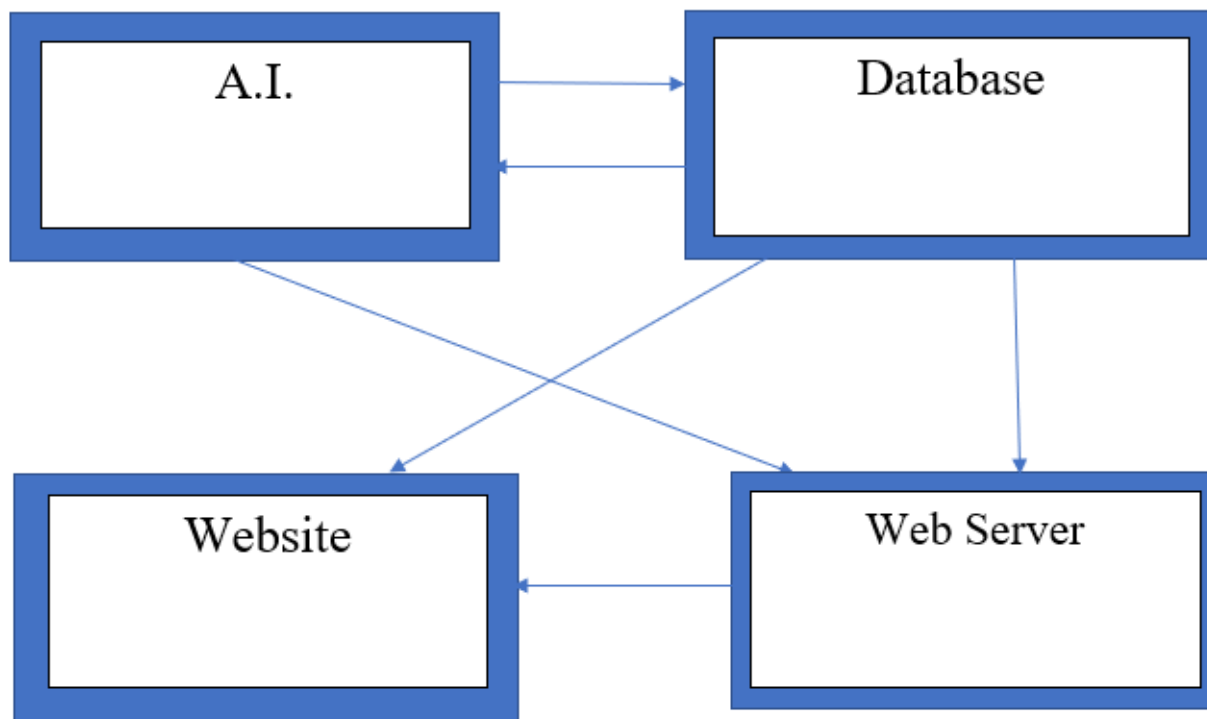
7 ROLES & RESPONSIBILITIES

There are many people the work on our website. Outside of the developers there are no stakeholders other than the customer. The developers are the ones who will work on and put up the website and we decided that it would be best to divide the project into 4 major sections. The first section is the AI. We needed the AI to predict the stock market changes. The AI will need to train, so for this we needed to use test data of stock markets changes from an API called Tiingo. This all is in the first section which we have called the AI development and the section is mostly run by Kameron Slater. The next section is Back-End Development. This section includes the web server and the database. The web server is where we will post our website on. The database is where we will store our information from the AI. This section is made and led by James Adams. Another section is the Front-End Developer. The Front-End developer is the person that will made the website. They will work to make the website easy to use and easy to understand. The website is the piece that the customer will see, so the website will need to look nice also. This section is done by Malcomb Coley. The final section is the Project Manager. This is a very important role because they make sure that everyone is up to date. They watch over the project and remind and discuss major events that will happen in the future. They will be a point of contact for any customer issue. They also work with anyone that is falling behind or struggling to accomplish their task. This role will be filled by Kyle Setzer. All these roles of a massive impact on the success of our project.

8 COST PROPOSAL

The other requirements that will be required for the project to be completed are to make sure that customers are able to register for the website and add their information to the database. Decided on an interface for the website that will be easy for people to use. A simple interface will allow the users to be able to understand the website. These features will make the website more accessible to experienced pros in the stock market to people who are just getting into stocks.

9 FACILITIES & EQUIPMENT

For all the equipment that we will be using. The AI will need data to train with so that it can predict the direction the market is moving. This data will be provided by the online API Tiingo. Tiingo is a website that tries to bring the best and most reliable data to everyone. It was made by former quantitative traders. They have built a network connectivity infrastructure right at the exchange data center, crawler farms using NLP data that they were studying for over a decade, and API so we can get a better set of structured, faster, and more accurate data. We will also be using the Google API for our login feature. This will allow anyone with a Google account to use it on our website rather than create a new account for us specifically. The Tiingo API and the Google API are the only outside sources of information or technology that we will be using for this project. The AI itself will be created by hand along with the website, web server, and the database.

10 ASSUMPTIONS
- Tiingo API will function properly indefinitely.
- Web server access will be provided by the University
- The hosting server will have enough memory to store our data
- The hosting server will have enough processing power to train our models
- Hosting server will have sufficient power supply

11 CONSTRAINTS

- Final prototype will be completed by April 20, 2020
- Final prototype will run smoothly with little to no bugs
- Access to the web server though May 10, 2020
- Request restrictions of the Tiingo API
- Internet restriction due to firewall and University security
- Uncertainty of the stock market

12 RISKS

Risk description	Proba-bility	Loss (days)	Exposure (days)
Added workload or time requirements because of new direction, policy, or statute	0.2	10	2
API key for Tiingo becoming invalid	0.50	3	1.5
Unavailability of team member	0.3	2	0.6
Unexpected infinity loop while training model	0.01	1	0.01
Loss of internet connection	0.01	1	0.01
Loss of power	0.01	1	0.01

13 DOCUMENTATION & REPORTING

13.1 MAJOR DOCUMENTATION DELIVERABLES

13.1.1 SYSTEM REQUIREMENTS SPECIFICATION

This document had an initial release date of February 4th, 2020. This document will be updated in the event we decide to move our projects focus or requirements in a direction that was not listed previously. Final delivery will be no later than, May 1st, 2020.

13.1.2 PROJECT CHARTER

This document will have an initial release date of February 18th, 2020. This document will be updated in the event we decide to move our projects focus or requirements in a direction that was not listed previously. Final delivery will be no later than, May 4th, 2020.

13.1.3 ARCHITECTURAL DESIGN SPECIFICATION

This document is still under initial review and will be released no later than March 17th, 2020. This document will be updated in the event we decide to move our projects focus or requirements in a direction that was not listed previously. Final delivery will be no later than, May 4th, 2020.

13.1.4 DETAILED DESIGN SPECIFICATION

This document is still under initial review and will be released no later than March 31th, 2020. This document will be updated in the event we decide to move our projects focus or requirements in a direction that was not listed previously. Final delivery will be no later than, May 4th, 2020.

13.1.5 SYSTEM TEST PLAN

This document is still under initial review and will be released no later than April 21st, 2020. This document will be updated in the event we decide to move our projects focus or requirements in a direction that was not listed previously. Final delivery will be no later than, May 4th, 2020.

13.2 RECURRING SPRINT ITEMS

13.2.1 PRODUCT BACKLOG

Items placed in the backlog will be prioritized by group vote and member availability. All updates and relevant information will be published to Github upon completion of each individual task.

13.2.2 SPRINT PLANNING

Sprints will take place once every other week, with the first due on January 23, 2020 and the final due on May 4th, 2020. This makes a total of eight sprints

13.2.3 SPRINT GOAL

Sprint goals are to be discussed during weekly meetings to ensure each member is on schedule.

13.2.4 SPRINT BACKLOG

Each layer of the project has a minimum of one team member working. As long as progress is made weekly, the schedule will not be affected

13.2.5 TASK BREAKDOWN

Each team member has their assigned area of the project. Each member is responsible for delivering a product that is within the agreed guidelines by each deadline.

13.2.6   SPRINT RETROSPECTIVE

One team member will be in charge of taking notes during our group meetings. This member will also fill out the Retrospective outline, leaving the individual parts blank, and send to the rest of the group to complete.

13.2.7   INDIVIDUAL STATUS REPORTS

Status reports will be given during weekly meetings

13.3 CLOSEOUT MATERIALS

13.3.1   SYSTEM PROTOTYPE

The system prototype will include a locally ran Flask server, the webpages needed, a python script to download the needed data, and a python Machine Learning program to create the predictions. This will be demonstrated on April 30th, 2020.

13.3.2   PROJECT POSTER

The project poster will include the following sections: "Design Problem" which includes our project mission, "Design Architecture" which includes the architecture design of our project, "Design Implementation" which includes all of our requirements, "Results" which includes our sample predictions for two companies, and "Conclusion" which includes a few of our future and success requirements.

13.3.3   SOURCE CODE

Our source code is available for download on Github.

13.3.4   SOURCE CODE DOCUMENTATION

All documentation will be uploaded to Github in the form of PDF's.

13.3.5   INSTALLATION SCRIPTS

Installation instructions will be provided.

13.3.6   USER MANUAL

A digital user manual will be provided.