A Purposeful Walk Down Wallstreet

Exploring Advanced Data Analytics in Financial Markets



Development Plan

Version 3.0

July 30, 2020

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# VERSION HISTORY

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| **Version #** | **Implemented By** | **Revision Date** | **Approved By** | **Approval Date** | **Reason** |
| 1.0 | William Aman,  Sri Padmini Jayanti  Minhajul Abadeen  Frino Jais | 05/21/2020 | William Aman  Sri Padmini Jayanti  Minhajul Abadeen  Frino Jais | 05/21/2020 | Original copy of document submitted to Professor Seyed. |
| 2.0 | Sri Padmini Jayanti William Aman | 06/13/2020 | Sri Padmini Jayanti William Aman | 06/13/2020 | Added Revision History table, edited the Project Schedule section according to Professor’s feedback and edited Scope & Technologies section due to our changed project goals. |
| 3.0 | Sri Padmini Jayanti William Aman  Frino Jais  Minhajul Abadeen | 07/29/2020 | Sri Padmini Jayanti  William Aman  Frino Jai  Minhajul Abadeen | 07/29/2020 | Added content to redefine the scope to include the algorithms our team created. Revised Project Schedule. |

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# Project Overview

The stock market is a very volatile place. Many experts, stockbrokers, and other market-traders use various resources to help them make decisions on what to buy and sell in the market. However, there are countless sources giving varying recommendations on the same stocks. The problem is that these discrepancies put a lot of pressure and responsibility on the trader to decide what to do with all this inconsistent information. The solution to this problem is a program that can do all this work for the user. A program that can analyze various data and produce predictions that assist its user in the decision-making process when it comes to trading on the stock market.

# Project Purpose, Scope, and Objectives

For this project, our team will be working to make modifications and additions to a legacy project entitled “A Purposeful Walk Down Wallstreet”. This project was developed in 2014 and has been maintained by many Wayne State University undergraduate teams ever since. This project is centered around a program that works as a data analytics tool. The project’s function is to collect and process data in a way to produce stock market predictions. As mentioned above, the project has been active for around six years. Thus, each team has contributed to the project in different ways. The purpose of this specific project is the migration from one software to another, to make improvements to the existing algorithms, as well as develop new algorithms to be used for stock forecasting.

The scope of this project contains the legacy program that has been passed along to us. Our team is responsible for all the files included in the source repository for this program. We will also be required to interact with two additional programs to meet our goal. These programs are Tableau and Power BI and they are enterprise-level, publicly available programs. However, our interaction with them will be solely as standard end users. Our team will not be responsible for making changes to their source code.

There are various objectives that our team must meet in order to deliver a successful project. The primary objective is to migrate the frontend of the software from using Tableau to using Power BI. Another adjacent objective is to make improvements to the legacy source code. This means modifying algorithms to improve the accuracy of the predictions they produce, as well as create new algorithms for stock forecasting.

# Team Organization

Each member of the team will be expected to participate and contribute to the overall development of the project with respect to their predetermined roles and responsibilities. The team leader will facilitate and oversee all tasks, as well as keep track of the team’s performance. Roles and responsibilities will be assigned based on an individual’s strengths and experiences. Team members may also be asked to work on tasks outside of their given role when necessary. The team will follow a predetermined schedule that each member must adhere to for deadlines during development. In the case that a team member has an issue or cannot complete a given task by the deadline, he/she will be required to report this problem to the team lead.

Team member roles and responsibilities are as follows:

**Frino Jais**

* Team Lead
  + This role is responsible for overseeing all operations and for facilitating tasks amongst the team. This individual will also be the main point of contact when communicating with the client or professor.
* UI/Frontend Lead
  + This role is responsible for the leading the design and development of the user interface. This also includes leading the transition from the current UI platform (Tableau) to a new platform (Power BI).

**Sri Padmini Jayanti**

* Database/Backend Lead
  + This role is responsible for leading the design and development of the backend of the application. This includes the improvement of currently implemented algorithms as well as introduction of new strategies.

**William Aman**

* Documentation Lead
  + This role is responsible for ensuring that all documents maintain professionalism and are free from mistakes and errors. This individual will be responsible for the final delivery of each document.
* Presentation Lead
  + This role is responsible for ensuring that all presentations are professional. This includes verification that there are no mistakes, as well as following strong design principles.

**Minhajul Abadeen**

* Quality Assurance Lead
  + This role is responsible maintaining a high level of software and code quality. This involves the use testing and review to ensure the delivered product meets the expectations of the client.

# Problem Resolution Policies

In an effort to provide an acceptable and efficient method of team collaboration and fairness, a strictly enforced problem resolution policy will be set in place to regulate any issues that may arise throughout the course of this project. This policy will be based on a 3-strike system, where a strike is given for any of the following instances:

* *Unexcused team member absence during a team meeting, class session, and/or presentation.*
* *Failure to meet a hard deadline.*
* *Lack of collaboration, communication, effort, and/or activity.*
  + *Any message received by a team member from any other team member must be replied to within 24 hours.*
* *Unacceptable behavior and/or lack of professionalism.*
  + *Use of profanity*
  + *Disrespectful comments or actions*
  + *Consistent excuses*
  + *Improper attire during video calls*

If any of the violations above are observed without a valid reason, a strike will be awarded to the applicable party. The first strike will consist of a written warning. The second strike will involve conducting a team meeting addressing the issue. The third strike will include the instructor in a team meeting to decide the individual’s consequence(s) which may include but is not limited to, probation or removal from the team.

Any issues that may arise regarding decisions or comments that the team makes will be resolved through communication among all members of the team. In the case of a disagreement, a majority vote will be conducted to come to a final decision.

# Project Plan (iterations, project schedule)

Developments, updates and questions on the project will be discussed in several occasions. The first being our internal team meetings which will be held every week on Monday, Wednesday and Friday at 5:00 PM. The team has also agreed to ad hoc meetings for reviewing each other’s work, doing demo presentations, or other impromptu cases. All meetings will be held through Microsoft Teams.

The second discussion occurrence is during meetings with our client, Mr. Joshua Feinstein. Our team will meet with him once a week. These meetings will be held on Wednesdays every week via Skype Business.

The third occasion would be to communicate openly with our instructor, Professor Seyed. Our team lead will be sending detailed reports of our work to our Professor every Monday. This will enable us to express our concerns or questions more frequently and maintain a more transparent relationship with our instructor.

## Project Schedule:

1. Team Formation and Basic Understanding (May 12 – May 17):
   1. Our team has configured groups on Microsoft Teams and WhatsApp to share files, converse, and set up meetings.
   2. We have developed a basic understanding of the project with discussions and have explored the technologies used.
   3. Our team has put together an introductory presentation about the organization and scope of our project which we presented to the class on May 14.
   4. We have become familiar with our communication platforms and have devised a schedule for the rest of the semester.
2. Research and Development Plan (From May 18):
   1. The first week after being assigned the project, our team will set up the application on each team member’s computer with the help of the previous semester’s documentation.
   2. From our client meeting, we have collected information to help with the preparation of our Development Plan documentation, which we will be presenting to the class on May 21.
   3. Research on the technologies that will be used, general terminology, and financial instruments used by our client will be completed before demonstrating our findings to our client on May 27.
3. Software Requirements and Design
   1. June 11 – Software requirements specification will allow us to describe some low-level deliverables of our project. It will also showcase the overall project requirements that our team and client have agreed upon.
   2. June 23 – The Design document and its presentation will consist of the technical design structure of our application. It will focus on the overall architecture of the project and how we have built the code with proper dependencies.
4. Prototypes
   1. June 9 – The first prototype presentation to the class will focus on showcasing the running application. Our team will showcase the different layers of the application and identifying areas of development, along with what new implementations we will be making.
   2. June 30 – Our second prototype will provide measurable achievements and improvements on the implementations made so far. This will showcase the measurable developments made in the project and the fulfilment of as many functional requirements as possible to this point.
   3. July 21 – The third prototype will showcase the final version of our entire application. We will showcase our project goals of improving the accuracy of the MSF algorithms, as well as the development of new algorithms created. Additionally, we will show views in Power BI with as many dashboards as possible.
5. Improvements, Final Testing, and Submission
   1. July 23 – The final testing phase will consist of executing the application several times to test different use cases.
   2. July 30 – Present the achievements of our entire project to the class.

# Configuration Management Plan

The project will be managed and controlled through the version control website known as GitHub. Team members will pull and commit code into our team repository every day. The act of pulling and committing code will provide proof of work each team member is contributing to the project. Mr. Feinstein and Professor Seyed will be able to look in the repository and review each team members contribution to the project.

Communication will be managed through Microsoft Teams. Meetings will be conducted through Microsoft Teams and any updates to the project goal shall also be conducted through Microsoft Teams. In the case of any emergency amongst the team members, the secondary method of communication will be through text messaging and/or WhatsApp. Communication with the client will be done through “Skype for Business” on a weekly basis.

# Technologies

The technologies used for this project will reside in front-end, middle, and back-end layers. Each layer will play an important part once all the layers work in conjunction at the end of the project. The technologies our team will be using, which were provided by the client, are listed below:

**Front End Layer:**

* Power BI: Power BI will be used as the data visualization tool for the project. The intended front-end using Power BI should be a collection of predictive models/graphs with different metrics.
* Tableau: Tableau is the existing data visualization tool used for this project. Although our final program won’t use Tableau directly, we do need to have it running properly so we can transfer the current data visualizations created in Tableau to equivalent representations in Power BI.

**Middle Layer:**

* GitHub: Used as a code repository, GitHub will be the main version control software used to push front-end and back-end code to the repository, as well as pull updated code from the repository.
* Python: The middle-layer will be written in Python. Python code will be written and executed in conjunction with the back-end and front-end. Python has many data visualization and data science libraries that can be used to formulate a predictive model in this project.

**Back End Layer:**

* MySQL Workbench: MySQL Workbench is a relational database management system. It will be used to store all the data needed for this project. This data includes stock data, macroeconomic data, and algorithm prediction data.