

STOCK TRADE SIMULATION

DESIGN DOCUMENT

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Team Peerless

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PROJECT SCOPE

Team-Peerless has decided to create a stock simulation web-based application that will help individuals learn how to invest their money, understand the stock market, and gain confidence to make their first investment. The stock market will consist of the NYSE (New York Stock Exchange) and NASDAQ. The application will use virtual currency (so that the user assumes no real risk) while incorporating real world stock data so that the user can have the most accurate and real experience with the stock market. This type of approach will allow for the most efficient internalization of stock market knowledge while instilling safe and proper investment habits, such as researching stocks and assessing risk.

The stock market is an incredibly powerful resource that is also difficult to understand. It can provide many benefits and rewards for the investor if they have a understanding of how the market works. Unfortunately, the stock market is very complex and few people have the patience to understand the stock market. We want individuals to have the necessary knowledge and trial-runs to benefit without losing real capital. When it's time for the first investment, using their learned ability to invest effectively to further their financial status. Almost anyone would love to have extra cash in their pocket and we all would also want an ease of mind for future needs such as a house, car, children and their tuition.

For the initial release, the primary target are students in high school and universities throughout the country. Many schools are already providing financial literacy classes, such as accounting and economics, so this type of educational tool would appeal to many students and faculty members. It is essential for the upcoming generations to understand finance, especially when it

comes to investing for certain things like saving, retirement, higher education, and personal needs.

In the near future, we plan on making this application open to anyone in the country. So, users can willingly sign up for our service to expand their knowledge about the stock market and improve their personal finance.

PROJECT VALUE

There are many different options when it comes to creating value for this project. We believe that the majority of our users will be using the free subscription option. Because of this, most revenue will be generated by in-app advertisements. Advertisements can be static banners found on the top or bottom of each page, or they can be somewhat more dynamic, such as pop-ups that occur after an action is made (selling a trade, for example).

Another option for generating revenue is having users register for the paid subscription, which can be either a monthly payment, a semi-annual payment, or a full one year subscription payment. Price for membership will be discounted depending on how many months of membership are purchased. Currently, monthly subscriptions are \$9.99, 6 months' costs \$49.99, and a full year costs \$99.99. Benefits of subscriptions include no in-app advertising as well as early access to future updates.

Finally, we will be marketing this application to educational institutions. License agreements will provide us with a substantial amount of revenue, since the average class size in the US is about 21 students in high school, and the average classroom size at Iowa State is about 33 students.

Since multiple sessions of each course will be offered, we can expect a minimum of 100 users per institution. We may also be able to provide student discounts for memberships if the education institutions choose to not purchase a license to use the application in class.

Other than generating revenue, this application will also provide educational value for its users. We believe there is a large population of people who show interest in the stock market but also have not had any exposure to the market. According to the National Financial Educators Council, the average American scores a 63.17% on a financial literacy test. By using this application, users will be exposed to more financial terminology as well as experience the consequences of certain financial incidents. Our hopes are that this application will provide an opportunity for users to increase their financial literacy.

APPLICATION FUNCTIONALITY

The below are our proposed functions of the application, some functions may subject to change if we are unable to implement in time for the final release.

- **Leaderboard** - Our application is designed to be used by groups in a classroom setting, friends or just as individuals. The leaderboard will be able to compare your calculated score globally or locally if you are working on this in a group. The score that our leaderboard will be using to determine how each user is performing will be a profit/loss ratio. That ratio is: $(\text{Total Gain} / \text{Number of Winning Trades}) // (\text{Total Loss} / \text{Number of Losing Trades})$
- **Help Resources** - Unless a user is an experienced trader, they might need some help getting started, so we will provide the right resources.

- In-App Purchases - As a way to generate revenue and make users more competitive, this will allow users to purchase extra virtual currency or future functions in the program. Our program is designed around real market data, so these purchases will not change that data.
- Ads on the Site - Another way to generate revenue would be advertisements on the webpages.
- New User Tutorial - When a user signs in for the first time they will be greeted with an on-screen tutorial. This tutorial should be detailed enough where after a user is done watching it they will have enough knowledge to get started trading.
- Buy/Sell/Trade stocks - Buying and selling stocks will be the core of our program. Users will be able to see real data on the stocks traded publicly and make buying and selling decisions. Data on these stocks will include live and past prices.
- Provide financial analysis of data and possibly have a predictive model on changes that can be made to a portfolio for a better profit margin.
- Two accounts: Teacher and student, only difference is that the teacher can see a list of students and their portfolio performance. (Add classes/students with course ID)

The below functions are our current ideas on improving this application in the future to make it better.

- Blackboard Integration
- Crypto-Currency
- Interactive Chat Bot for help

DATA SOURCES

These are the candidates for our stock data. There will be more research conducted on these sources to see licensing and pricing options and if it is feasible.

- Investopedia Trading API (<https://tinyurl.com/l4fmw4d>)
- Xignite Stock API (<https://tinyurl.com/k4hjdhl>)
- Market on Demand API (<https://tinyurl.com/myukbyq>)
- Quandl API (<https://tinyurl.com/hmzmtud>)

LANGUAGES AND TOOLS

The programming languages that will be used in completing this application are as follows:

- Python
- JavaScript
- Hyper Markup Text Language (HTML)
- Cascading Style Sheets (CSS)
- Structured Query Language (SQL)

The following tools will be used in achieving a completion of our proposed project:

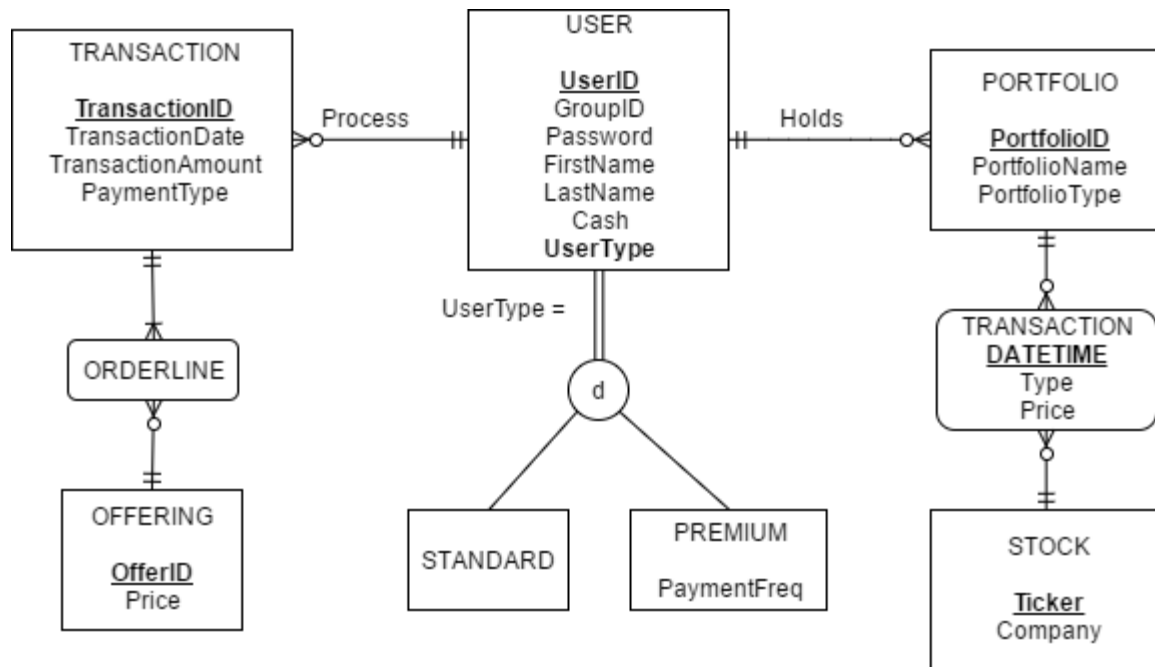
- Atom
- Eclipse IDE
- Adobe Dreamweaver
- Google Docs, Slides
- Draw.io

The Python libraries, which are subject to change, are as follows:

- Flask
- JQuery Plugins
- Django

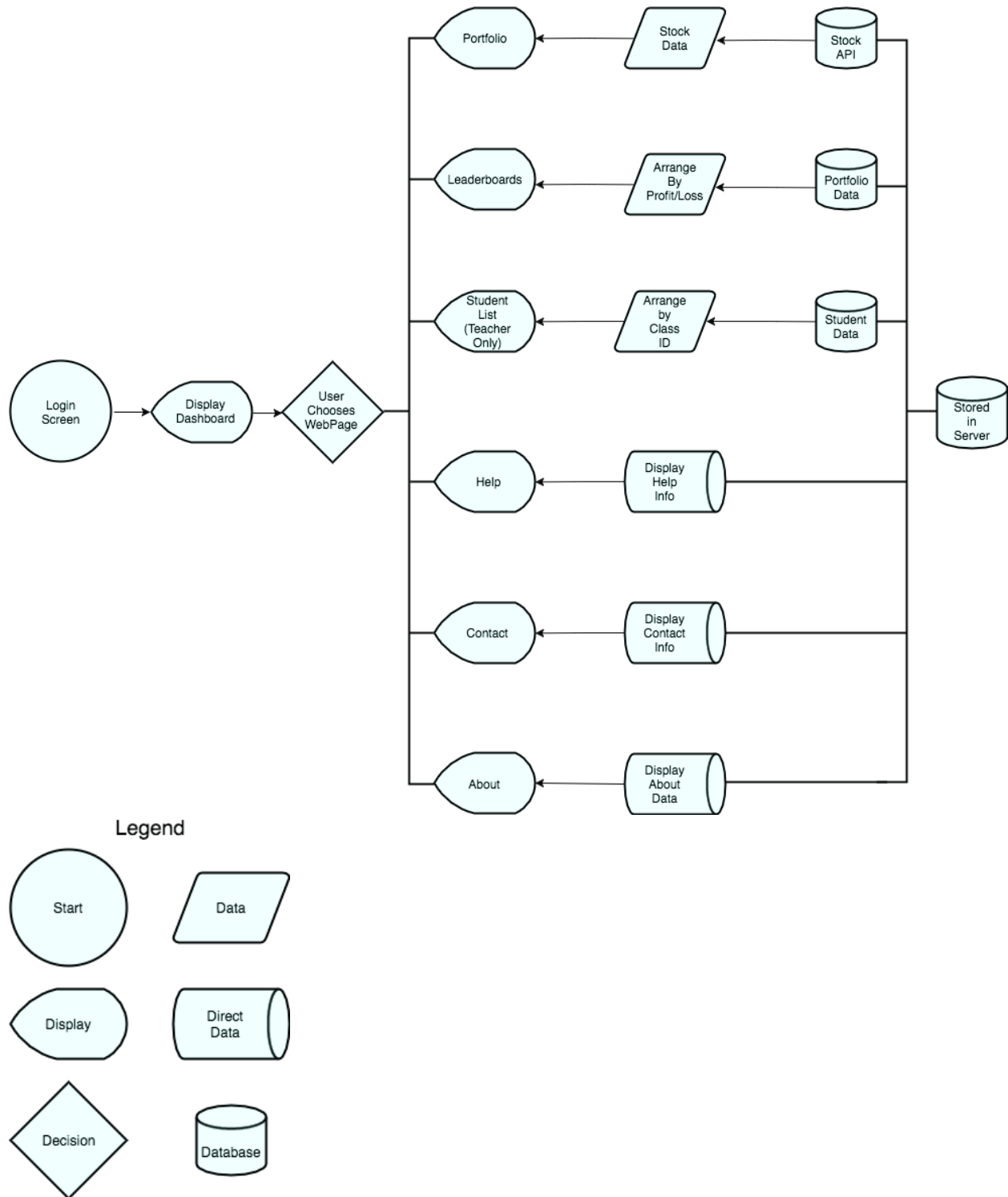
ENTITY RELATIONSHIP DIAGRAM

The below diagram indicated the relationship between the various entities in our application and a setup of the internal database that will store such information.

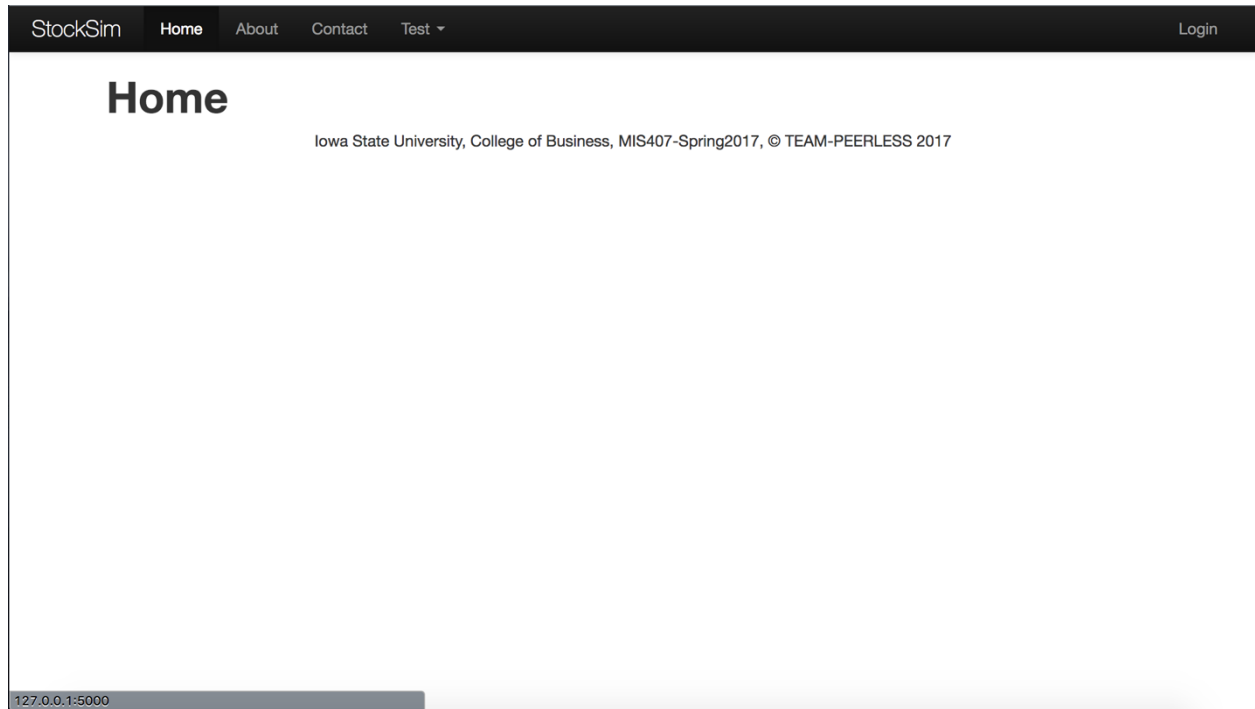


APPLICATION FLOWCHART

This is a flowchart of the website that the consumer will be using and how the data that is displayed on webpages are retrieved.

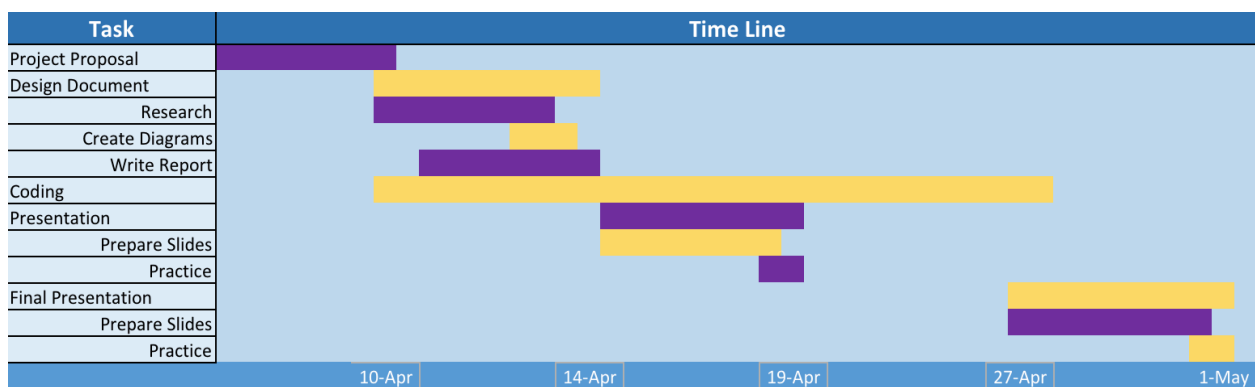


WEBPAGE WIREFRAME



The above picture is a template of our Home page, the tabs on the top left are the current webpages that we will have, these are subject to changes before the final release.

GANTT CHART



The above chart includes the basic components of this project and the estimated time to complete these components. Members will be working together on all of these components.

TEAM MEMBERS

All team members have a part in during the duration of the project. Below are listed the roles that each member took on primarily, but it should be noted that developers helped with documentation and members in the documentation role helped with development as well.

NAME	ROLE
Jesse Espinoza	Development
Nathaniel Hinshaw	Development
David Jennings	Documentation
Matt Rafalko	Documentation
Teddy Reinert	Development
Pritam Shyam	Documentation

DESIGN APPROVAL

Team Peerless would like approval of this document to begin the software development phase and have this application completed in time for the given due date.

Approval by Professor Tim Smith

Date