
User Requirements *for* “Capital Games”

Report 1: Part 1
Software Engineering
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Contributions Breakdown

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Category	Points	Jeff A	Eric C	Nick P	Jeff R	Val R	Dario R
Project Management	10 Points	0%	0%	0%	0%	0%	0%
Customer Requirements	9 Points	0%	0%	0%	0%	0%	0%
System Requirements	6 Points	0%	0%	0%	0%	0%	0%
Functional Requirements	30 Points	0%	0%	0%	0%	0%	0%
User Interface Specifications	15 Points	0%	0%	0%	0%	0%	0%
Domain Analysis	25 Points	0%	0%	0%	0%	0%	0%
Plan of Work	5 Points	0%	0%	0%	0%	0%	0%

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1 Customer Statement of Requirements

1.1 Problem Statement

Perhaps nothing portrays capitalism better than the Stock Market. The ability for individuals and collectives to gain equity in international corporations, trade that equity, and perhaps even gain a profit, has piqued the imagination of a nation for well over a century. One could even say that owning stock is part and parcel of The American Dream.

However, there is a barrier that separates this dream from reality for many would-be investors: an understanding of the market. The stock market has myriad intricate ways of bundling and exchanging instruments, most of which will be beyond the ken of an economic novice. An economist may be interested in the differences between Mutual Funds and Exchange-Traded Funds; a banker may have the judgment to decide between a Stop Order and a Market Order. These financial techniques offer greater flexibility and control over investments to experienced investors and scientists, who are masters of the field. The beginner does not care to be bothered by these techniques, as they can turn a straightforward process into an overwhelming headache.

With Capital Games we are interested in developing a learning platform for these students - a stock market simulation program.

Capital Games is marketed at two primary classes of user; students and novice investors, each of whom have different needs. Students require a social aspect to their experience - shared simulation instances with global rules and social features. Novice investors require performance metrics and research tools. Both require interactive tutorials, visualization tools, and email updates, in addition to the core requirement of being able to execute various types of trades.

At its simplest, Capital Games is about exchanging stocks and managing investments. This is done through the respective menus for each Research, Trading, and Managing Portfolios. Research allows investors to analyze relevant financial metrics of publically traded corporations. Trading allows investors to place market, stop, and limit orders for their various portfolios. Managing Portfolios allows investors to view their investments and performance metrics for each of their simulations. In all menus, data can be visualized and interactively examined, in addition to being tabulated. This unprecedented level of accessibility will ease accessibility to market trend analysis.

Portfolios and trades only exist in the context of leagues, or market simulation instances. Each league has with its own rules, administrators, and varying privacy levels. Investors can participate in both public leagues, which anyone can join but offer less social interactivity, and private leagues, which require private email or Facebook invitations but which have expanded social features. Leagues are social because they include Trade Streams of executed trades from league members, Investor Profiles containing trade history and portfolio performance of investors, and a Comments Board. Additionally, each league will have a scoreboard for its members portfolio performances. Top investors will have their names and net worth displayed prominently on league

pages.

As a site with social content, it is also important to have the ability to moderate and review submissions by users. This is provided by having two classes of moderators, League Managers and Site Administrators. League Managers are, by default, the users who create a given league, and can ban, invite, and promote users within their leagues, as well as being able to delete comments and create league-wide announcements. League Managers, by default, are also participating in a given league. Site Administrators can delete leagues, ban users and delete comments, add front page announcements, view reports about abusive users, and view other various statistics about users, trades, and leagues.

These features, together with other core capabilities such as email updates and interactive tutorials, provide the most cutting-edge and modern platform for both individual and collaborative efforts to conduct financial simulations.

1.2 Glossary of Terms

League - an instance of a market simulation with a predefined rule-set and containing many *investors*. All leagues are created by a *League Manager*. There are two types of leagues:

- **Public** - Any Investor can join this type of League
- **Private** - A private league can only be joined through invitation or accepted request

Order - An *investor* must place an order for the purchase or sale of a *stock*

- **Stop Order** - A type of order used to protect gains or limit losses. Stop loss orders are activated if a stock drops below the stop price and buy stop orders are activated if a stock rises above the stop price. When activated, a Stop Order becomes a *Market Order*.
- **Limit Order** - A type of order used to prevent trades from occurring except at indicated prices. Buy limit orders will only be executed at or below the indicated price, and sell limit orders will be executed at or above the indicated price. Limit orders are not guaranteed to ever be executed and expire after a specified duration.
- **Market Order** - An order to be executed as soon as possible at current market prices.

Portfolio - A detailed account of the *stocks* associated with an *investor* in a given league. Portfolios are unique.

Stock - A type of asset that represents ownership of a corporation.

- **Ask Price** - The price at which a trader is willing to sell a stock
- **Bid Price** - The price a trader is willing to pay for a stock.
- **Ticker Symbol** - an abbreviation used to uniquely identify publicly traded shares of a particular stock on a particular stock market.
- **Symbol List** - a list of a market/several market's ticker symbols

User Roles - Each user with an account can have one or more of the following roles

- **Investor** - A person who commits capital expecting to see it grow in value. Users are referred to as *investors*.
- **League Manager** - A League Manager is an *investor*. A user does not necessarily have this role for every league they are in. Only ones in which they created the League or were given a League Manager role from another League Manager of that League
- **Site Administrator** - This is the most powerful role. A Site Administrator is a *League Manager* for every *League* that they are in
- **Suspended** - A user with this role is currently pending losing their Suspended Role, or granted a *Banned* role. While suspended an *Investor* cannot do anything with their Account other than login and view the duration of their suspension, The reasoning behind their ban, and an appeal form if the situation permits.
- **Banned** - A banned user can never be unbanned, this occurs after a rejected suspension appeal.

2 System Requirements

2.1 User Stories

Identifier	User Story	Weight
ST-1	As a user, I can register an account so that I may participate in Capital Games.	10 pts
ST-2	As a user, I can join or create leagues so that I may compete with others in a simulated stock market environment based on real-time stock data.	10 pts
ST-3	As a user, I can search for companies both by company name and stock symbol so I may scout companies I would like to invest in.	6 pts
ST-4	As a user, I can browse a companies profile and view the performance data over a configurable span of time so that I may determine whether or not I want to invest in them.	6 pts
ST-5	As a user, I can buy or sell stocks within a fantasy league I am a member of so I may build my fantasy league portfolio.	10 pts
ST-6	As a user, I can manage my portfolio within a league to track my investments.	8 pts
ST-7	As a user, I can visually track my finances via graphs and charts so I may more easily manage my portfolio.	4 pts
ST-8	As a user new to the stock market, I will have access to tutorials that teach about the stock market via a specially created novice fantasy league.	6 pts
ST-9	As a user, I can see the performance of stocks I invested in via a stock-ticker like marquee so I may have a quick overview of my day-to-day performance.	3 pts

ST-10	As a user, I can see an activity stream of recently executed trades by other users in my leagues so I am always up to date.	5 pts
ST-11	As a user, I can see the performance of other users' portfolios so I may observe the investment habits of others.	2 pts
ST-12	As a user, I can view a list of all members in each of my leagues so I know how many others I am competing with.	1 pt
ST-13	As a user, I can view a portfolio leaderboard so I may have a summary of relative performance between users in my league.	1 pt
ST-14	As a user, I can report a user being abusive so I may continue having a positive fantasy league experience.	5 pts
ST-15	As a user, I can message other users so I may interact with people I am playing within and out of my league.	4 pts
ST-16	As a user, I can post, edit, or delete comments to league pages so I may communicate with leagues en masse.	2 pts
ST-17	As a user, I can opt to receive periodic e-mail notifications of my stock performance or trades so I may be kept up to date even when not actively viewing the site.	3 pts
ST-18	As a user, I can additionally link my account with Facebook so I may share my fantasy league experience with friends.	1 pt
ST-19	As a user, I can recover or change my password so I may always have access to my own account.	5 pts
ST-20	As a user, I can access my profile and settings on a dashboard on the top of every page within the site.	8 pts
ST-21	As a user, I may opt to create a league and become a league manager so I may have my own personal league.	10 pts
ST-22	As a user who is league manager, I can add league rules, a league name, and a league logo to personalize my league.	8 pts
ST-23	As a user who is league manager, I may manage players within the league so I may invite players I want to join, ban players that are being abusive, and assign other league managers.	8 pts

ST-24	As a user who is league manager, I can moderate and delete comments in the league page.	5 pts
ST-25	As a user who is league manager, I can create league announcements.	4 pts
ST-26	As a user who administrates the website, I can view reports of and delete leagues that are abusive in nature.	2 pts
ST-27	As a user who administrates the website, I can delete abusive/offensive comments and ban users or IP addresses so the website remains a clean, positive stock market fantasy league experience.	6 pts
ST-28	As a user who administrates the website, I may post front page news or announcements.	3 pts
ST-29	As a user who administrates the website, I may have access to a user count, number of active leagues, total leagues, quantity of daily transactions, the most/least popular stocks, and newly created or banned users so I may have reliable site statistics.	9 pts

2.2 Nonfunctional Requirements

Functional

Additional features for security could be enabled through the use of gems in Ruby on Rails. There exists several packages for the purpose of authentication and authorization of applications. Devise is a Rails gem that provides solutions for authentication. Some key features to this gem are the ability to encrypt and store passwords, provide recovery options for users that have forgotten their password and store a cookie to validate the session. Cancan is a Rails gem that provides solutions for authorization. This will allow for a user to perform different actions based on their position. For example, a user will be able to comment and delete their own comment, but an admin will be able to comment and delete all comments on the league they are an admin of.

Usability

A key point in the design of this application is ease of use and appeal to the users. Through the use of CSS and Bootstrap, we will be able to make the theme of our application consistent and pleasing. With CSS, we will create a universal header and navigation bar that each page will build off of. Javascript will provide for responsiveness and it will be the key framework for which we build our interactive tutorials upon. The interactive tutorials are meant for inexperienced users in the topic of stocks to learn the fundamentals of the game. Any user that finds themselves lost later on can always view these tutorials again or browse through any specific topic.

Reliability

In order to ensure that there is no confusion to the user in the case of the internet or server failure, all transactions end with a final confirmation, and no changes to the account are made until after

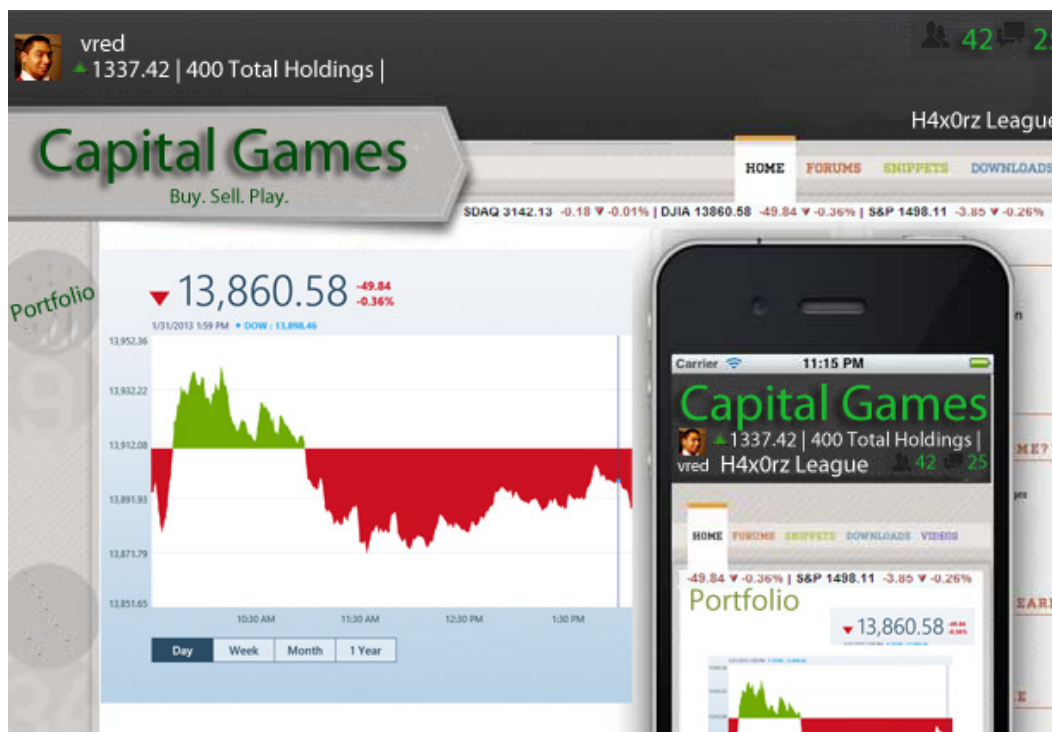


Figure 2.1: A mockup of one possible responsive design

this confirmation. A user that leaves the application and returns later will still be logged in. Server failures should be dealt with by the application's host.

Performance

The performance of the site is mostly maintained by the Rails framework. To monitor performance from the application, the Rails Performance Management tool is available to measure speeds and help find problem areas.

Supportability

Ruby on Rails provides measures for supportability. Rspec, Capybara and Cucumber are Rails gems that provide for testing that can be very similar to writing use cases. With these tools, the process of test driven development can be facilitated. The project should be highly portable in the sense that a user will be able to access the website on all major browsers and mobile devices, and have a specialized appearance for both. For maintainability, there is the option of a user to be a site admin. These users can view In order to spread the application beyond the bounds of the english speaking world, the Rails i18n API provides framework for translating to provide multi-language support.

2.3 On-Screen Appearance Requirements

The on-screen appearance requirements fall into three general areas including utilizing responsive design, conforming to most popular screen resolutions and refraining from the use of non-universally

supported client-side technologies. As more and more devices are becoming capable of browsing the web, one of the main on-screen requirements is to implement responsive client-side markup that can intelligently adapt to the clients UI capabilities. These capabilities include screen size, screen resolution and input methods. With these points in mind, Capital Games will be built to be usable on traditional desktop browser environments as well as mobile platforms. Javascript will be used to determine the best presentation of a page depending on the users browser. While a number of standards are emerging in the mobile market in regards to standard screen resolutions, there is still great variability present in conventional monitor sizes and resolutions. According to w3schools.com, as of February 2013, less than 10% of Internet users have a screen resolution less than 1024x768. Therefore, an additional on-screen appearance requirement make Capital Games usable with screen resolutions greater than or equal to 1024 x 768. Finally, client side technologies must also be restricted to ones that are universally supported. Adobe Flash technology will not be used, as it isnt universally supported. Flash can also become pretty sluggish on the clients browser. This constraint will most likely lead to faster content loading and a more fluid user experience. Instead, HTML5, CSS and Javascript will be used to facilitate interactivity and determine the most suitable presentation of content.

Project Management

References
