
Functional Requirements *for* “Capital Games”

Report 1: Part 2
Software Engineering
14:332:452

Team 2:

Jeff Adler
Eric Cuiifo
Nick Palumbo
Jeff Rabinowitz
Val Red
Dario Rethage

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1 Functional Requirements Specification

1.1 Stakeholders

As identified previously, the primary parties interested in this platform would be students and novice investors. However, due to the popularity of related platforms, it is not unrealistic that a future incarnation of this application could be marketed actively towards target groups. For instance, students would be promoted to this service to host various competitions; introductory texts on finance could also place references here. To that end, it behooves us to cater to those primary demographics.

At the same time, gaining a sufficient user base would also open the possibility of discreetly placed advertisements throughout the application. Therefore, we can consider marketing agents to be stakeholders as well, with the caveat that the site will not initially be designed with commercial product placement in mind. Our decision reflects a popular business model for firms today, in which an easily monetizable application does not compromise its rollout with commercials which can easily be implemented later. Yet another reason is the consideration of the various business expenses associated with a commercial rollout – notably the licenses and fees associated with having a commercial (as opposed to free) service.

1.2 Actors and Goals

Guest

An unregistered visitor or a visitor who is not logged in.

- Create an account
- View top users and stocks

User

A visitor who has registered and logged in to an account.

- Join/create leagues
- Take part in competitions
- Change personal settings

League Manager

A user who created or controls a league.

- Create a league competition
- Edit league settings

Site Administrator

A user who can control key aspects of the site

- Change global settings
- Create/edit global events
- View statistics of site

Database

The unit that holds information about all users' data.

- Push data back to views about users/events
- Store new data about users/events

Financial API

The unit that knows about current financial

- Retrieve data about stocks

1.3 Use Cases

Before a user can participate in most of the functionality of our site, the user must first join or create a league. To the user, creating a league is very similar to joining a league, the notable differences being that the user becomes League Manager of a league that they create and then must also invite users to join said league. Therefore, we detail joining/creation as a single use case. User invitation, as a responsibility of the League Manager, will be explored in a later use case. One relevant aspect of the responsibility of a League Manager to the use case though, is whether a league is made public or private; that is, whether it shows up in a public league listing page or can only be joined by direct invitation from the League Manager. Thus, our first use case involves a business policy:

CG-BP01: So that a user may create a join leagues with only their friends, leagues marked as private will not show up on the league listings unless a user is a current or pending member.

Thus, a user will only be able to browse listings of public leagues or private leagues to which they have access.

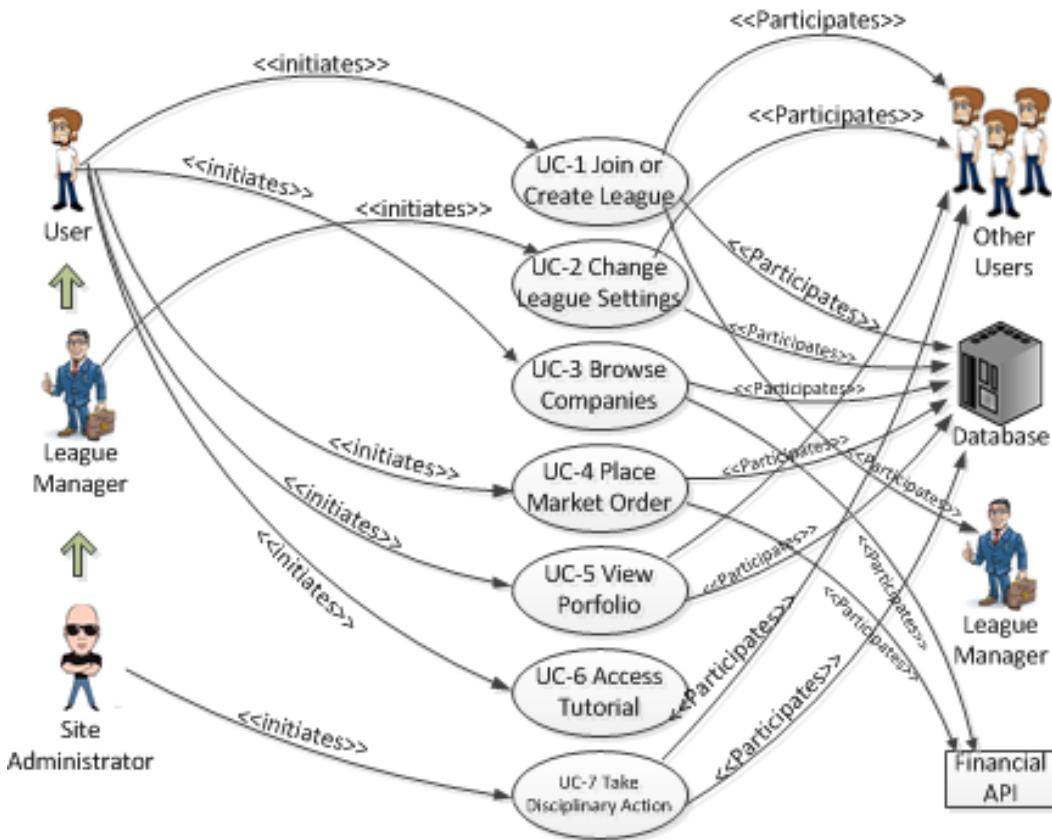


Figure 1.1: This graphic illustrates the relationships between the core actors of our platform.

Use Case UC-1 Join or Create League	
Related Requirements:	ST-2, ST-21
Initiating Actor:	User
Actor's Goal:	To join or create a fantasy finance league
Participating Actors:	Database, Other Users, League Managers
Preconditions:	<ul style="list-style-type: none"> -If joining a league, either a public league exists and has open positions or player has been invited to a private league -User is logged in
Postconditions:	The Database is updated to reflect the creation of or addition to the league
Flow of Events for Main Success Scenario:	
→	1. User navigates to leagues listing page
←	2. System displays public and pending private leagues available for the User , sorted by date created

→	3. User selects join on a league in which they are interesting in joining and to which they have access
←	4. System authorizes user and registers User into that league, notifying Database to update to reflect this change
Flow of Events for Extensions (Alternate Scenarios):	
3a.	The user selects create league rather than join league
→	1. User inputs desired league name and settings
←	2. System (a) creates the league and inputs it to the Database and (b) registers the User into that league as League Manager
4a.	The user attempts to join or create a league without permission
←	1. System rejects request and delivers reason for rejection

It is important here to note another business policy of our site relevant to the user's experience:

CG-BP02: A user is able to join an unlimited number of leagues and become League Manager for as many leagues as the user wishes to create.

Though the settings are selected when creating the league, any League Manager can change certain settings of their league at any time. These settings are comprehensive, including such items as name, privacy, number of spots, and duration. In addition, the League Manager can also manage members from the settings. However, certain settings cannot be changed after the league enters active competition, such as starting capital, commission rate, and margin, because changing primary competition rules mid-game would be unfair.

Use Case UC-2 Change League Settings	
Related Requirements:	ST-22, ST-23
Initiating Actor:	League Manager
Actor's Goal:	To change the settings of a league and manage its members
Participating Actors:	Database, other Users
Preconditions:	-User is the League Manager of the league -User is logged in
Postconditions:	-The league settings have been changed as desired and the Database reflects the changes
Flow of Events for Main Success Scenario:	
→	1. League Manager selects the league settings option from the league page
←	2. System requests the current settings from the Database and presents them to the League Manager along with options to change select settings
→	3. League Manager updates the settings, such as privacy, league name, number of spots, and managing users

←	4. System sends the updated settings to the Database
Flow of Events for Extensions (Alternate Scenarios):	
1a. The User selecting league settings is not the League Manager	
← 1. System requests the current settings from the Database and displays them, but does not provide ways to change them	
4a. The League Manager has altered the status of a league member	
← 1. System will request the Database to update the User's status in the league, be it becoming league manager or removing that User's instance from this league (banned)	

It is of some concern that League Managers may become abusive of their powers, and therefore it is important to create a policy to explicitly state how this power is treated. In modern fantasy leagues (such as football, baseball, etc.), the League Manager does not typically have their power moderated, and this has not caused any problems in the success of these fantasy websites. The ability to leave a league and join another is left to the users if they feel that their league manager has become abusive. Their joining of the league acts as an implicit contract to accept of the League Manager's settings. However, if this League Manager becomes a problem and users bring it to an administrator's attention, disciplinary action may be taken. Thus we generate the next site policy:

CG-BP03: A League Manager is able to change the status of users in their league without moderation. However, if a League Manager is deemed abusive, a site administrator may take disciplinary action against them.

Core to our site is the ability of the user to have access to information about companies so that the user may make informed decisions on how he would like to invest. As this is so crucial to the functionality of this project, it is absolutely necessary to make information easily available to the user and presented in a way that is clear and easy to understand. Therefore, the search of companies as mentioned in ST-3 should be simple to use and intuitive and the display of company profiles as mentioned in ST-4 should be such that a user can easily access any desired information about the company's financial performance.

Use Case UC-3 Browse Companies	
Related Requirements:	ST-3, ST-4
Initiating Actor:	User
Actor's Goal:	To bring up information on a desired company
Participating Actors:	Database, Financial API
Preconditions:	-Financial API is accepting inquiries -User is logged in
Postconditions:	-None worth mentioning
Flow of Events for Main Success Scenario:	

→	1. User begins entering a search term
←	2. System makes suggestions for companies in real-time
→	3. User enters search term or selects a suggestion
←	4. System (a) requests information from Financial API and (b) displays the information to the user in a clear and interactive manner
Flow of Events for Extensions (Alternate Scenarios):	
1a.	The User selects a direct link to a company rather than enter a search term
←	1. Same as step 4 above
3a.	The search term is invalid, i.e. the company does not exist
←	1. System informs user company does not exist and offers similarly titled companies as links

Note that the exact way in which the information requested from the Financial API is displayed to the user is not specified in this use case. This will be described instead in later sections about on-screen appearance requirements as to try to separate the functionality of the site and design of the site as separate as possible.

The goal of browsing companies ultimately is for the user to gain the knowledge needed to place market orders. Market orders are the atomic action of our site; i.e. the center point of every league is the user's ability to initiate transactions in an attempt to invest their money as best they can.

Use Case UC-4 Place Market Order	
Related Requirements:	ST-5
Initiating Actor:	User
Actor's Goal:	To place a market, stop, or limit order
Participating Actors:	Database, Financial API
Preconditions:	-Financial API is accepting inquiries -User is logged in -User is a member of a league
Postconditions:	-User's portfolio is updated to reflect change in position
Flow of Events for Main Success Scenario:	
→	1. User selects the league in which they would like to place the order
←	2. System displays prompt for market order, including type, amount, and company
→	3. User fills out form and requests the order be placed
←	4. System (a) requests market price from Financial API and (b) places the order into the Database

←	5. The order either resolves or expires, and the System updates the User's position in the Database accordingly
Flow of Events for Extensions (Alternate Scenarios):	
1a.	The User chooses to place a market order from a company's profile rather than from the league page
→	1. The User selects which league in which to place the order
←	2. The System takes the User to league marker order prompt as described in Step 2 above, with the prompt for company already filled out
→	3. Go to Step 3 above
4a.	The User does not have enough money or margin to place the order
←	1. The System informs the User that they do not have enough money or margin to place the order and returns them to the market order prompt

The potential kinds of orders referenced in the above use case are defined in the glossary. The details on the necessary computations to enact these orders will be defined in a section later on.

In order to keep track of their own finances and any of their fellow league member's finances, a user must be able to view member portfolios. This keeps with the competitive nature of our site in addition to allowing the user to track their own progress.

Use Case UC-5 View Portfolio	
Related Requirements:	ST-6, ST-7, ST-11
Initiating Actor:	User
Actor's Goal:	To view one's own finances or another's finances
Participating Actors:	Database, other Users
Preconditions:	<ul style="list-style-type: none"> -User is a member of a league -User is logged in -Database is tracking user's position
Postconditions:	-None worth mentioning
Flow of Events for Main Success Scenario:	
→	1. User selects a league member's profile
←	2. System requests that member's information from the Database and displays it in an organized and graphical manner to the User
Flow of Events for Extensions (Alternate Scenarios):	
2a.	The User is viewing their own portfolio
←	1. The System gives the System options to place market orders related to their existing positions

Once again, the exact display of information is not defined in the use case, but rather will be explored further in the section about user interface specifications. Next to discuss is the tutorial as referenced in ST-8. We consider this to be one of the main aspects that separates us from previous iterations of fantasy stock leagues; our site will educate users new to finance and enable them to learn all about the world of finance and how to invest, in addition to how these subjects relate to the use of our site.

Use Case UC-6 Access Tutorials	
Related Requirements:	ST-8
Initiating Actor:	User
Actor's Goal:	To become educated in finance
Participating Actors:	None
Preconditions:	-User is logged in
Postconditions:	-None worth mentioning
Flow of Events for Main Success Scenario:	
→	1. User selects the tutorial option from the site's main page
←	2. System displays possible topics on which the User may be educated on
→	3. User selects topic
←	4. System presents an interactive tutorial to the User , which will be further elaborated upon in a later section

In order to maintain a clean fantasy finance experience for our regular users, site administrators will reserve the ability to moderate other users—issuing warnings, suspensions, or even bans for abusive activity. To put it explicitly:

CG-BP04: Site administrators will warn, suspend, or ban users for abusive activity—this includes aggressive behavior on league comments or user messages, spamming users, joining numerous leagues without active participation, and anything else that is deemed to harm the experience for other users.

Use Case UC-7 Take Disciplinary Action	
Related Requirements:	ST-27
Initiating Actor:	Site Administrator
Actor's Goal:	To take action against an abusive User
Participating Actors:	Database, Users
Preconditions:	-Initiating actor is a Site Administrator -There are outstanding abuse reports
Postconditions:	-The Database is updated to reflect any actions taken against the User

The abuse report shows that it has been resolved on the administration page	
Flow of Events for Main Success Scenario:	
→	1. Site Administrator selects the site administration page option from the main screen (only viewable by Site Administrators)
←	2. System makes a request to the Database and displays all outstanding abuse reports
→	3. Site Administrator (a) selects an abuse report, (b) reviews the report, and (c) selects what action is to be taken (if any)
←	4. System implements the action selected by the Site Administrator and updates the Database accordingly

1.4 System Sequence Diagrams

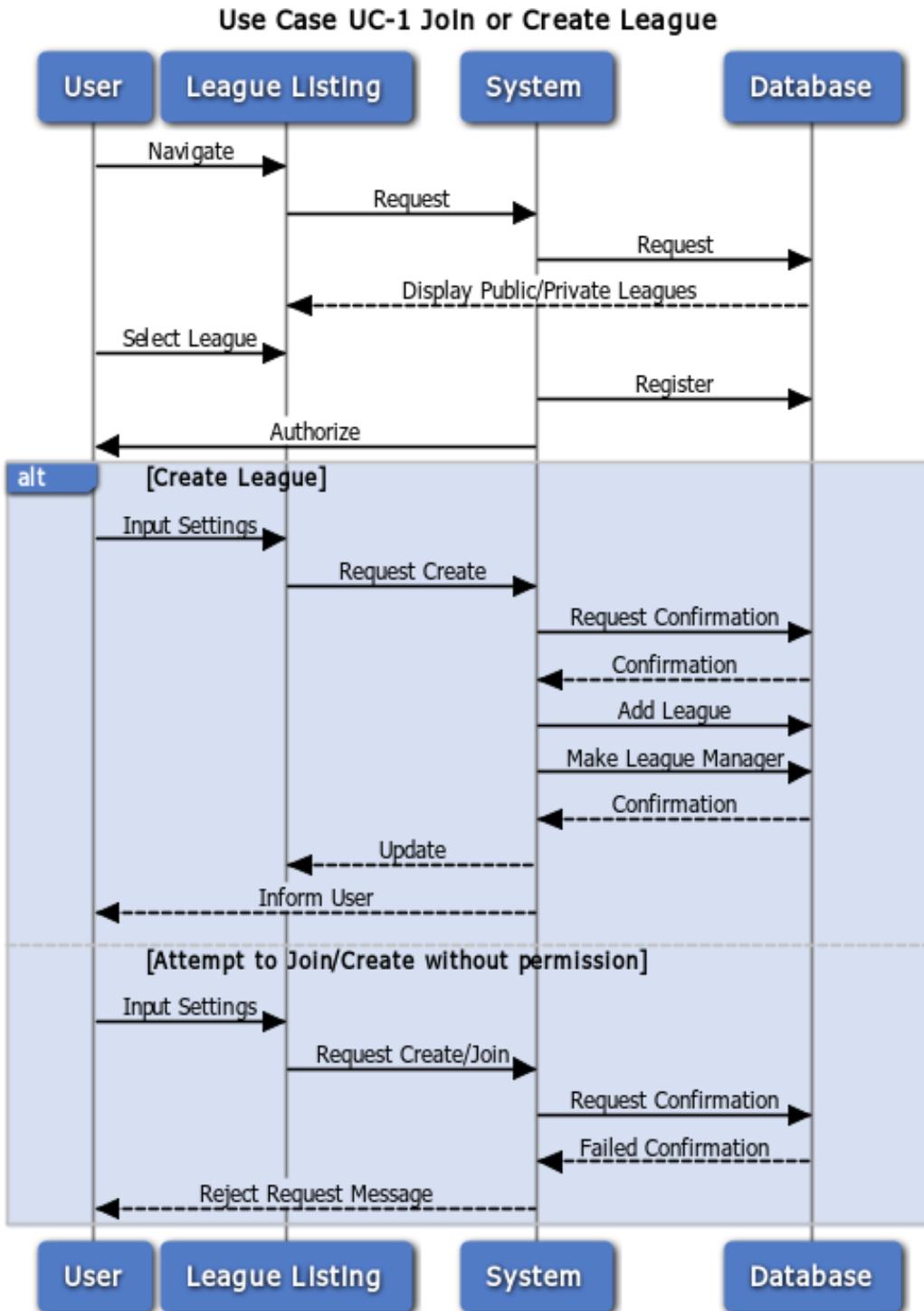


Figure 1.2: Sequence Diagram for UC-1 on page 4

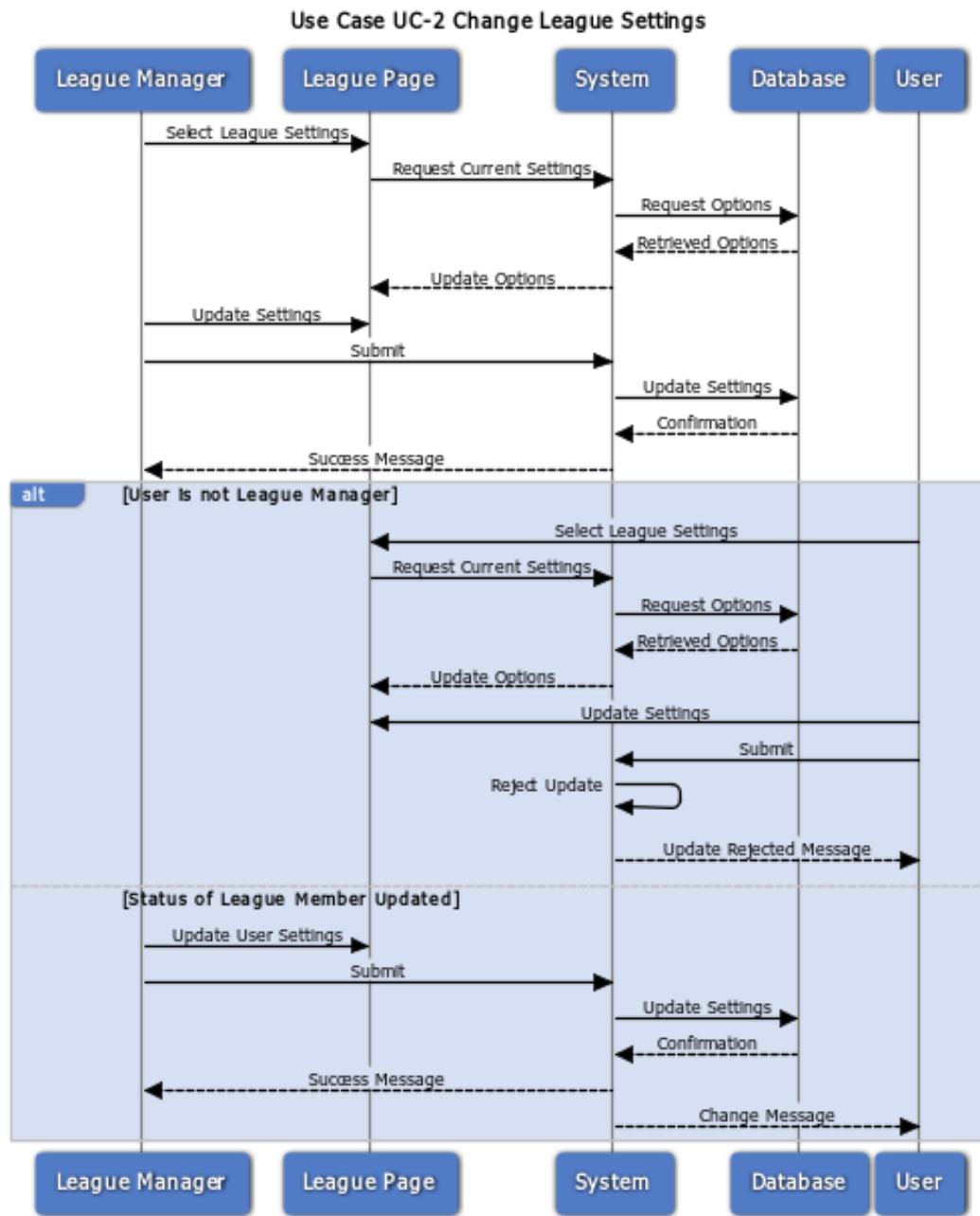


Figure 1.3: Sequence Diagram for UC-2 on page 6

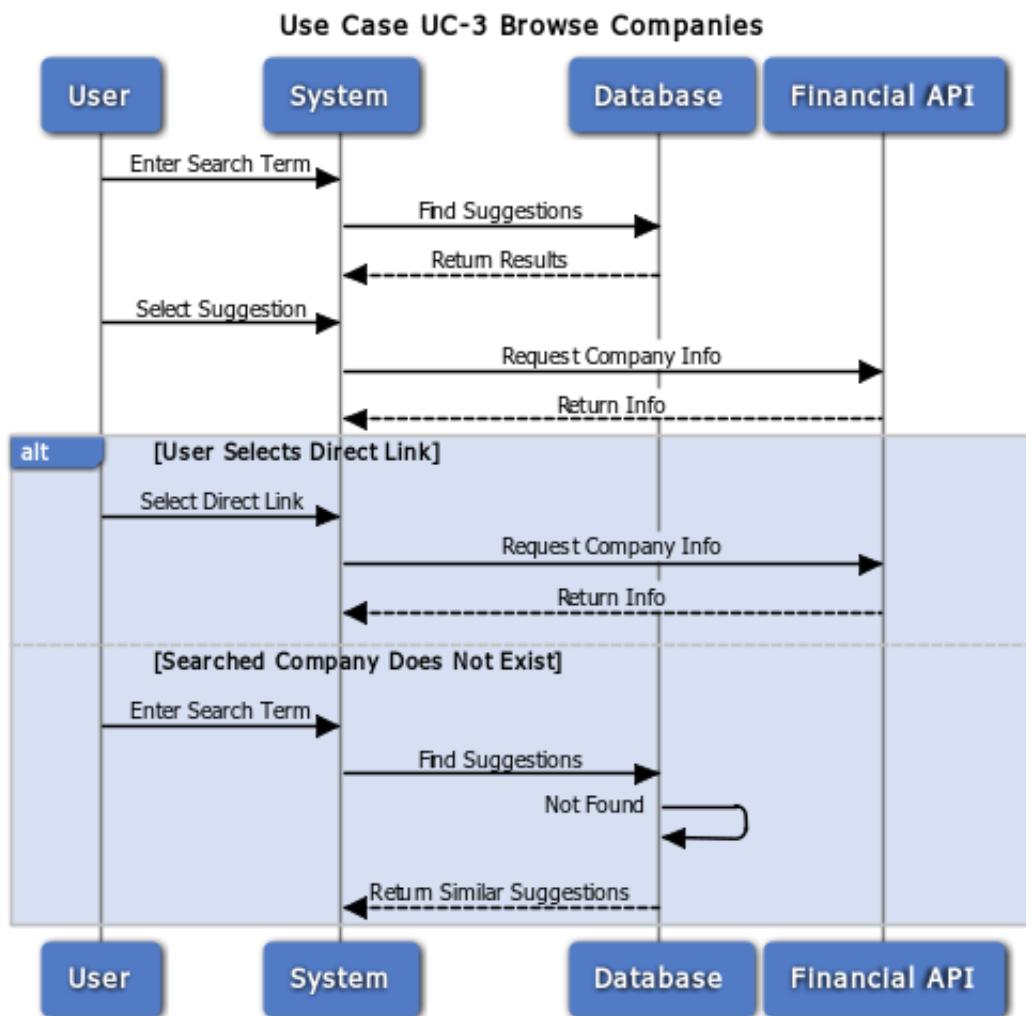
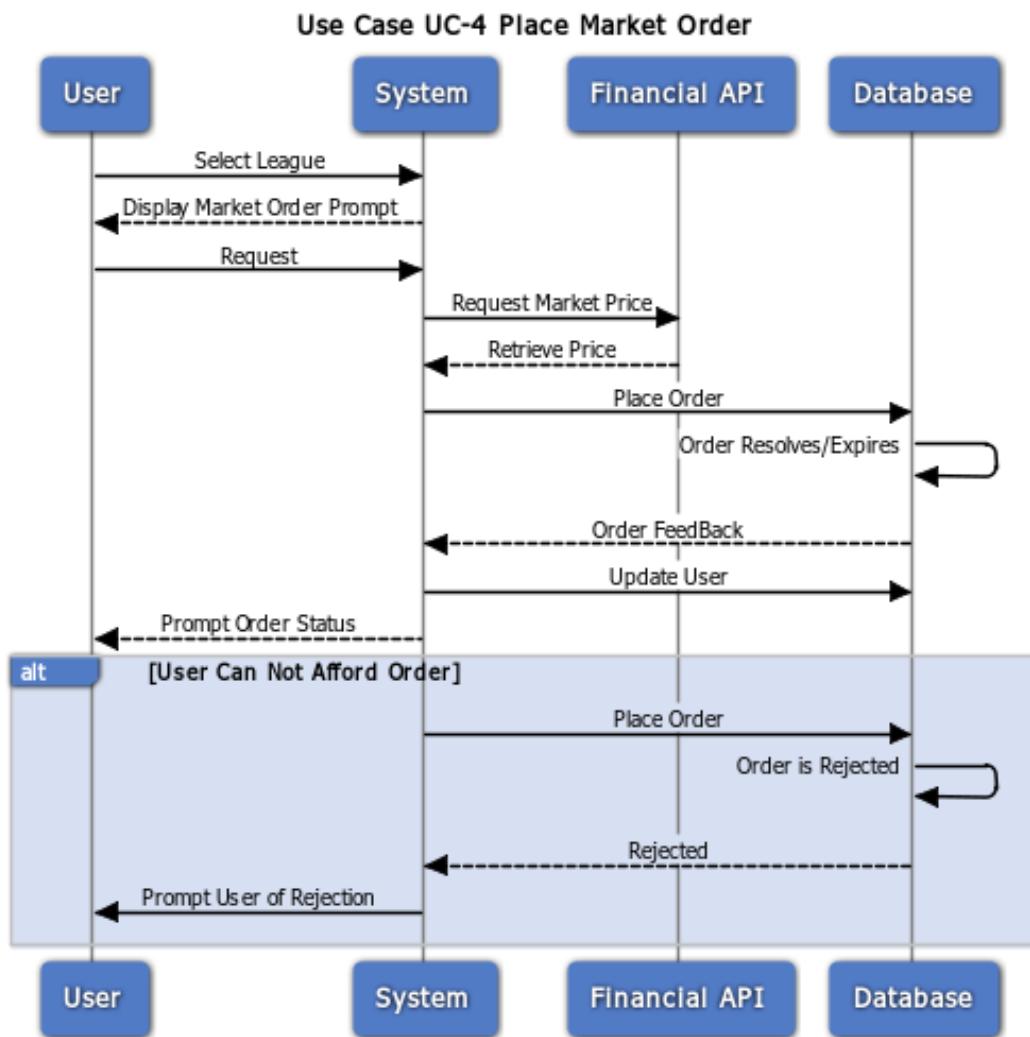


Figure 1.4: Sequence Diagram for UC-3 on page 7

Figure 1.5: Sequence Diagram for UC-4 on page [8](#)

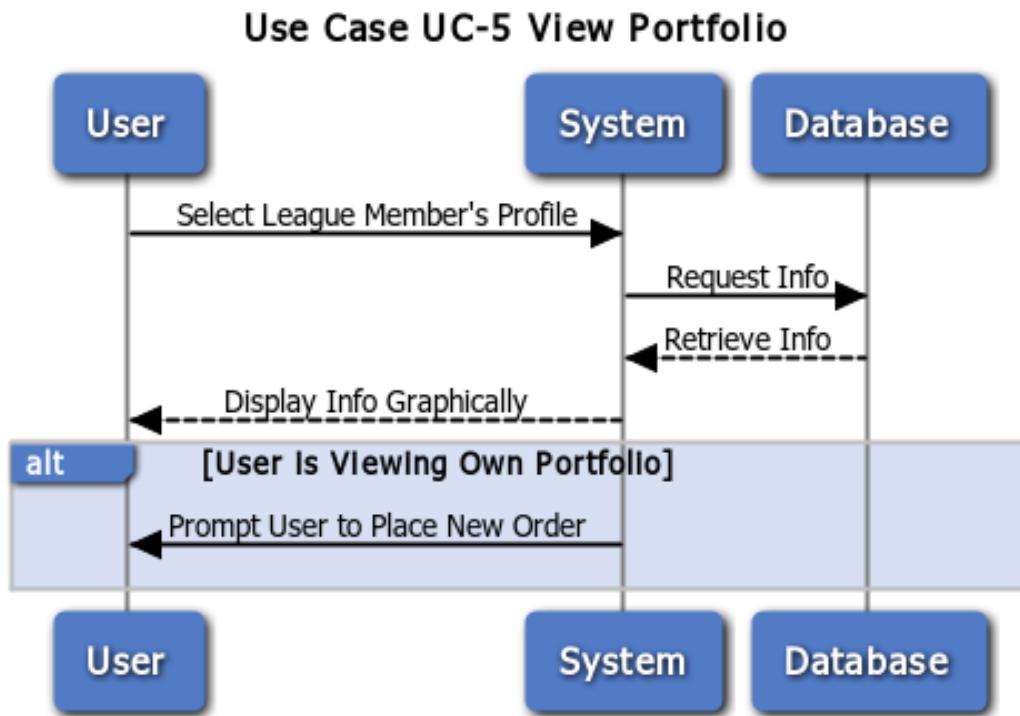


Figure 1.6: Sequence Diagram for UC-5 on page 9

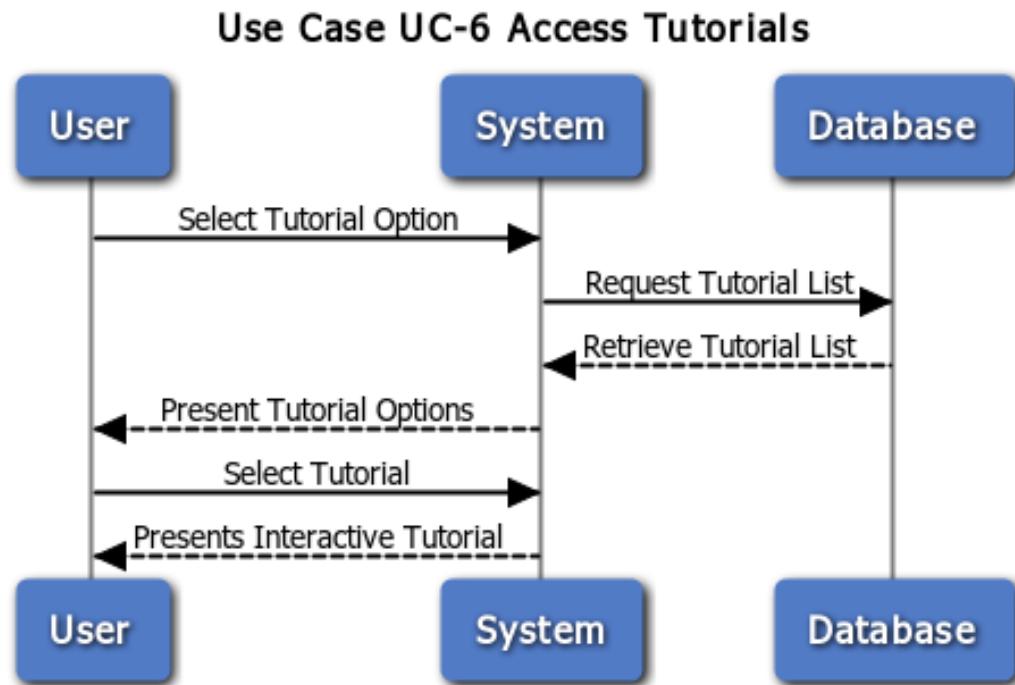


Figure 1.7: Sequence Diagram for UC-6 on page 10

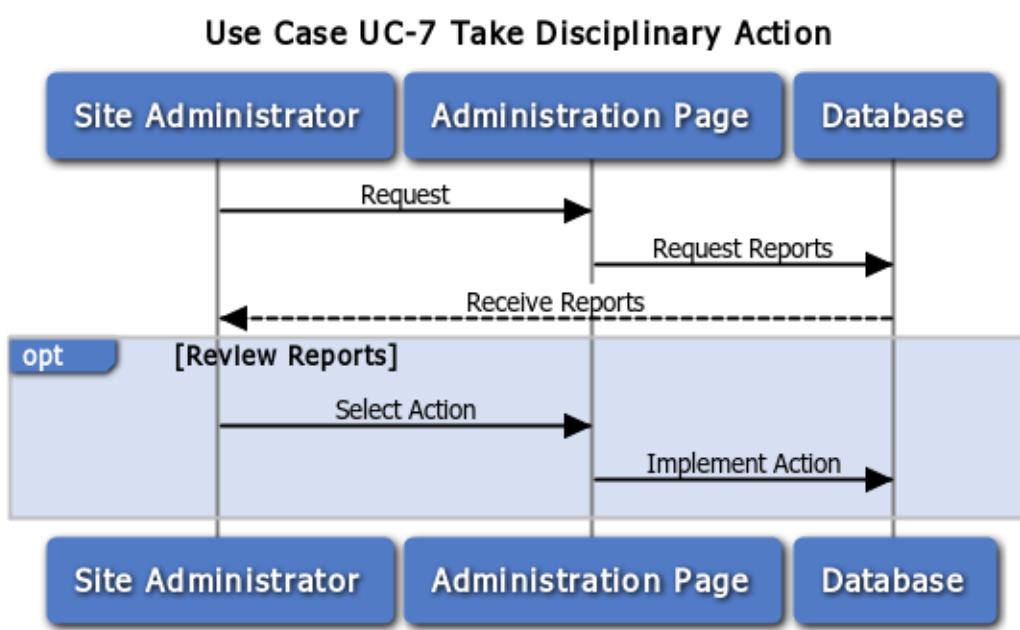


Figure 1.8: Sequence Diagram for UC-7 on page 10

2 User Interface Specification

2.1 Preliminary Design

See the illustrations below.

2.2 User Effort Estimation

Capital Games will utilize a streamlined user interface that has become rampant in modern web design. Essentially, all user interaction regarding login/sign-up and even actual interactions with their fantasy leagues and league portfolios can all be done within at most ten clicks and 50 keystrokes for data entry, and most of these interactions are in the registration process.

1. Login/Registration: 2 mouse clicks and 50 keystrokes
 - a) Click Login/Register on the corner of the header.
 - b) Data entry (20 keystrokes for username and password). (In addition, for registration, 10 to confirm password, 15 for e-mail address, and 5 for CAPTCHA for spambot control over the login/registration interfaces) In addition, all these keystrokes can be simplified in one click with Facebook integration, in which the site will pull their Facebook login data and use it for Capital Games.
2. League Portfolio Interaction: Buy/Sell, 3 clicks and 10 keystrokes
 - a) Click Portfolio tab in navigation menu header.
 - b) Hover over any company listing on the page with your cursor and click Buy/Sell.
 - c) Input amount of shares you want to buy/sell.
 - d) Click to confirm.
3. Create Fantasy League: 10 clicks and 10 keystrokes
 - a) Click League tab in navigation menu header.
 - b) Click Create New League in submenu.
 - c) Enter League Name and Click Checkboxes for desired rules.
 - d) Click to confirm.
4. Company: 3 clicks and 4 keystrokes

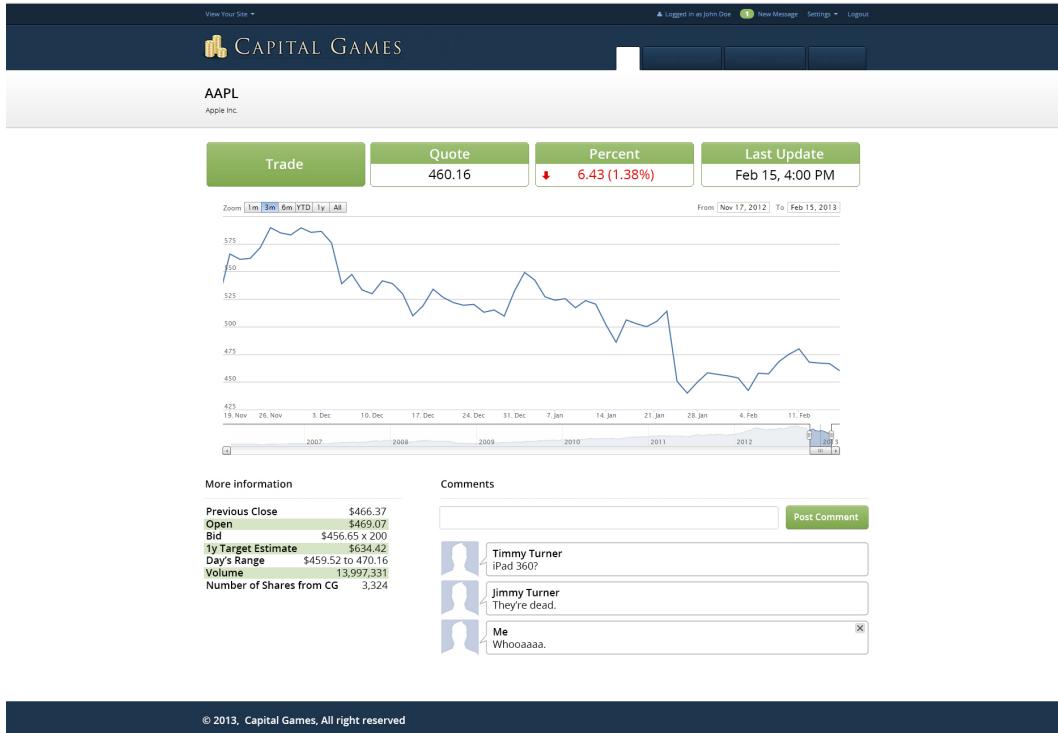
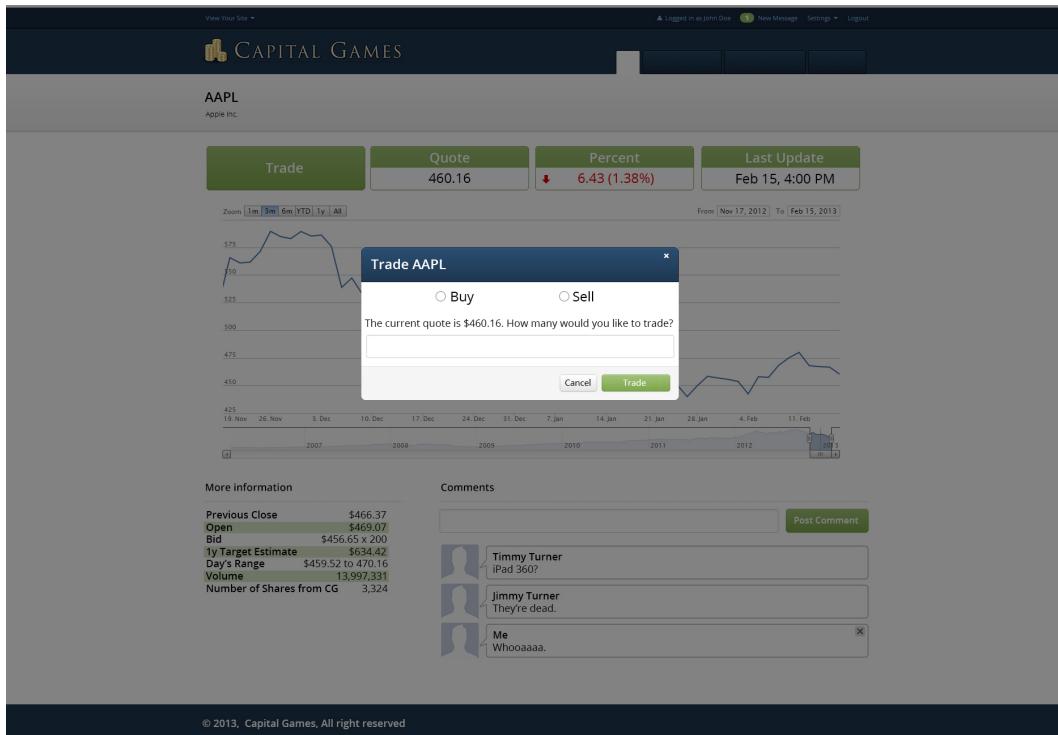


Figure 2.1: From the Company page, you are able to view details statistics about certain companies after being linked to it or searching for it. Major details, such as the quote, are up at the top while further details are at the bottom. A user can comment on the company on the bottom right. If you decide that you want to trade, you simply press the trade button and a box will pop-up, giving you options for the trade.



The screenshot shows a web application interface for a financial league named "The Money M4kers". At the top, there's a navigation bar with links for "View Your Site", "Logout", "New Message", "Settings", and "Logout". Below the header, the league name "The Money M4kers" is displayed along with its tagline "We're the best league ever ever ever." and a small icon.

Key statistics shown include:

- Join this League**
- Members**: 1030
- Start Date**: 1/23/13
- End Date**: 1/23/13

A ranking table lists members by rank, username, and market value:

Rank	Username	Market Value
1	cuffo	\$1,000,000
2	red	\$999,999
3	rethage	\$999,998
4	rabin	\$999,997
5	adler	\$999,996
6	palum	\$999,995
7	marasic	\$1
8	name	\$0
9	canada	\$0
10	hello	\$12,232,234

A button "See all members" is available to view the full list.

The right side of the page shows the top three places in the league:

- First place**: cuffo (Market Value \$1,000,000, Portfolio Value \$986,425, % return 40.94%, Last activity Bought 3 GOOG, Friends 1230)
- Second place**: (Placeholder)
- Third place**: (Placeholder)

Below the ranking table, there are sections for "Activity" and "Comments".

Activity shows recent actions:

- Announcement: Hey guys. I'm the admin.
- Timmy Turner: Bought 200 shares of MSFT
- Timmy Turner: Sold 200 shares of MSFT
- Timmy Turner: Bought 200 shares of MSFT
- Timmy Turner: Sold 200 shares of MSFT

Comments section:

- Timmy Turner: What are we doing about this loser?
- Timmy Turner: First!

At the bottom, a footer bar contains the text "© 2013, Capital Games. All right reserved".

Figure 2.2: From this page, you are able to view a certain league. Up at the top are the main facts about the league as well as a button to join/quit the league and the icon for it. In the middle, there is a ranking system to show the users in the highest standing. Down at the bottom, you can see the activity and also comment on the league itself.

- a) Press the Trade button
 - b) Select Buy/Sell
 - c) Type in number of stocks
 - d) Click to accept
5. League Users: One click
- a) To view all members of the league, click See All Members
 - b) As an Administrator or League Manager, deleting comments is one click on the delete button next to a comment
6. League Manager: Four clicks
- a) Click League Settings
 - b) Click Users tab
 - c) Edit anything
 - d) Click Save Changes
7. Messages: 2 clicks plus message
- a) Click friend from drop down list

The screenshot shows the Capital Games website interface. At the top, there's a dark header bar with the site name 'CAPITAL GAMES' and a navigation bar with links for 'View Your Site', 'Logout', 'New Message', 'Settings', and 'Logout'. Below the header, the page title is 'The Money M4kers' with the tagline 'We're the best league ever ever ever.' A sidebar on the left contains 'League Settings' (1030 members), 'Start Date' (1/23/13), and 'End Date' (1/23/13). The main content area displays a table of member rankings, a 'See all members' button, and a 'First place receives \$100,000' section. On the right, there are 'First Place', 'Second Place', and 'Third Place' sections, each featuring a user profile (cuiocco) with their market value, portfolio value, % return, last activity, and friends count. Below this, there are sections for 'Activity' (listing recent trades) and 'Comments' (with a post from Timmy Turner). The footer contains the copyright notice '© 2013, Capital Games, All right reserved'.

Figure 2.3: A league admin will see the join/quit button on a league as the settings page for them. When they click on that, they are brought to a page that gives them many settings they can change for the league, the most typical being the name, description and icon.

This screenshot shows the 'Edit Basic Settings' page for the 'The Money M4kers' league. The left sidebar has a 'Basic' tab selected, along with other tabs for 'Users', 'Comments', 'Security', and 'League Statistics'. The main content area is titled 'Edit Basic Settings' and includes a note about available settings. It features fields for 'League Name' (set to 'The Money Makers'), 'Short Description' (set to 'We're the best league ever ever ever.'), and 'League Icon' (a preview of the current icon). At the bottom, there are 'Save Settings' and 'Cancel' buttons, and the footer contains the copyright notice '© 2013, Capital Games, All right reserved'.

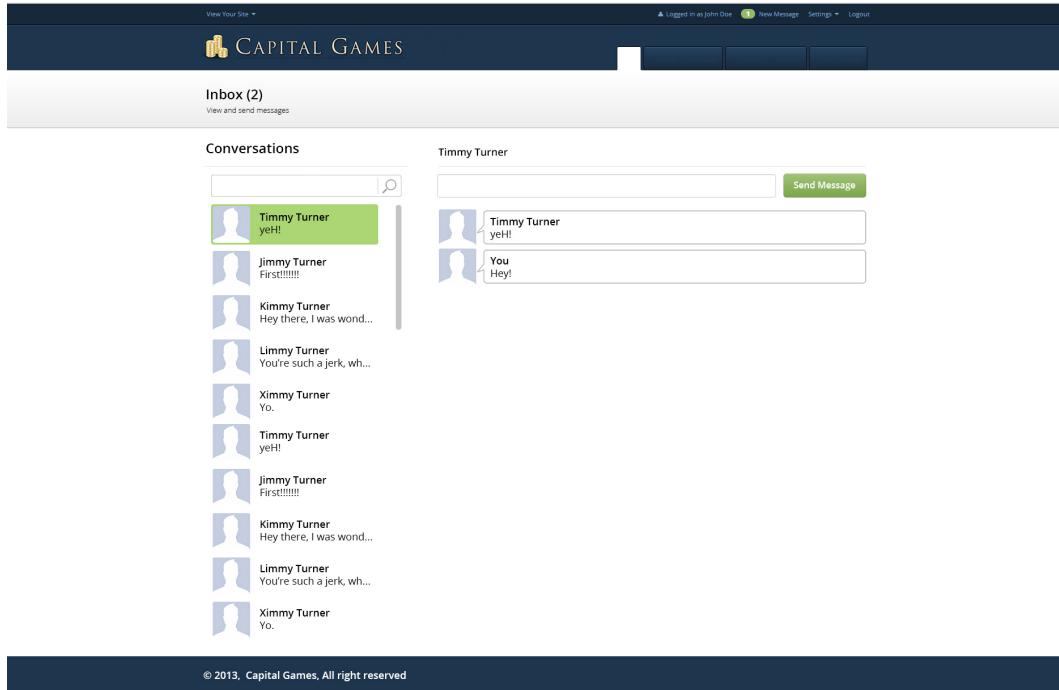


Figure 2.4: A league admin will see the join/quit button on a league as the settings page for them. When they click on that, they are brought to a page that gives them many settings they can change for the league, the most typical being the name, description and icon.

- b) Enter message
- c) Click send

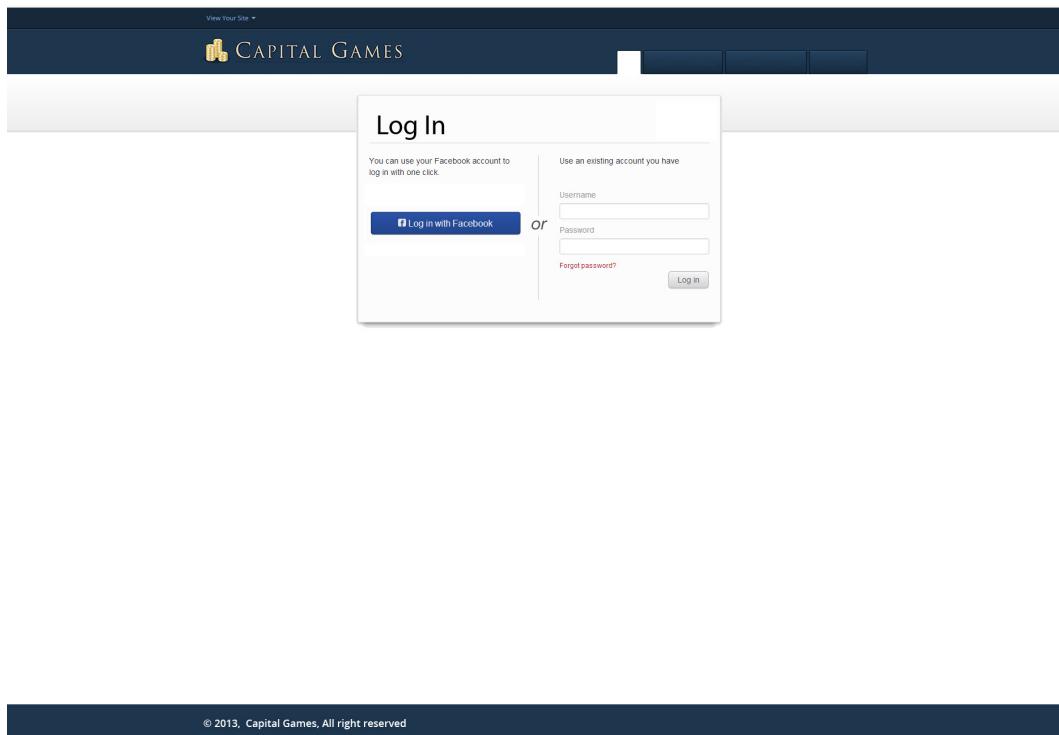


Figure 2.5: Users would be able to login simply by clicking a login button on the top-right hand corner of the screen, which would take them to a prompt in which they can enter their username and password. This would only require one click and about 20 keystrokes from any page of the website. Users logged in to facebook may also take advantage of Facebook integration and instantly log in with 1 click.

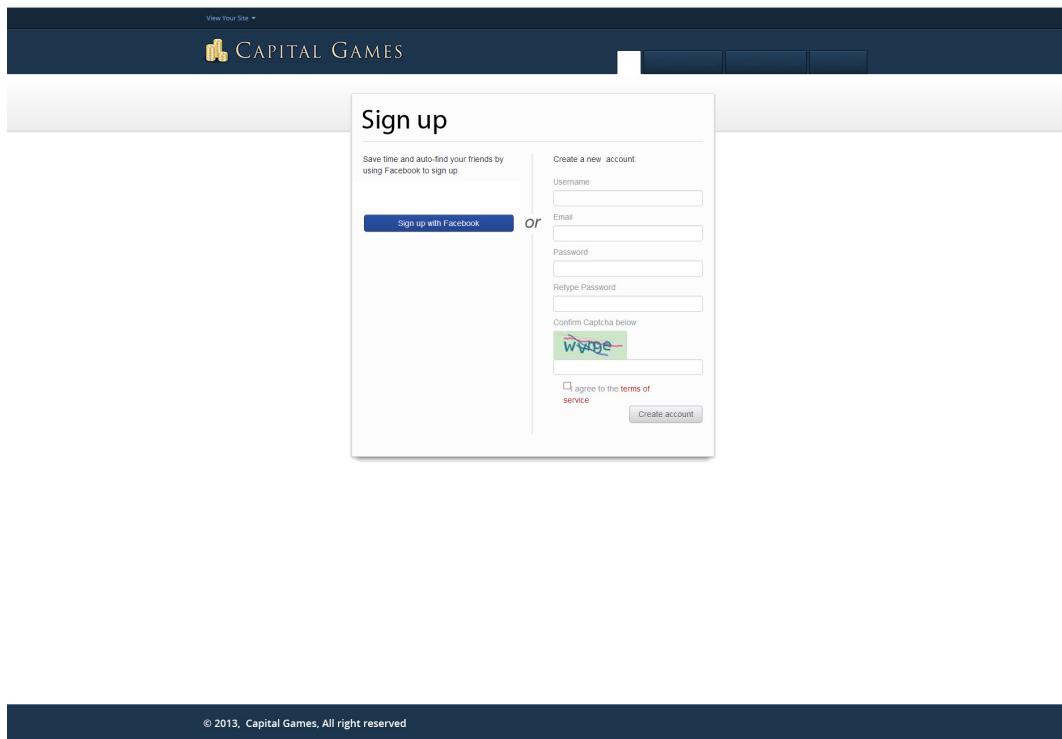


Figure 2.6: Users who are not logged in will also have the “Sign Up” button available to them in the header that will enable them to register for Capital Games. This can be accomplished within 1 click and 50 keystrokes. A user logged in to facebook may also instantly register within 1 click.

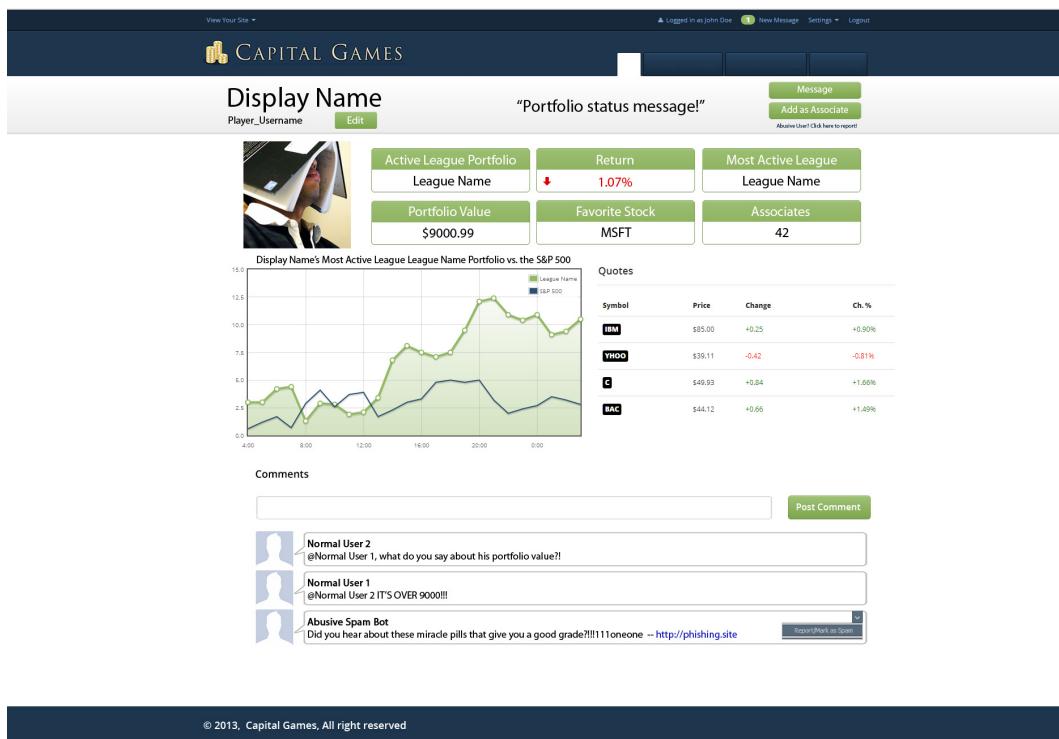


Figure 2.7: Users may access their Portfolio by clicking a menu tab in the top header of the website. This view enables them to conveniently see a summary of their return, active league, portfolio value, stock, and other data pertaining to their stock. They would be able to edit it in one click via the edit button.

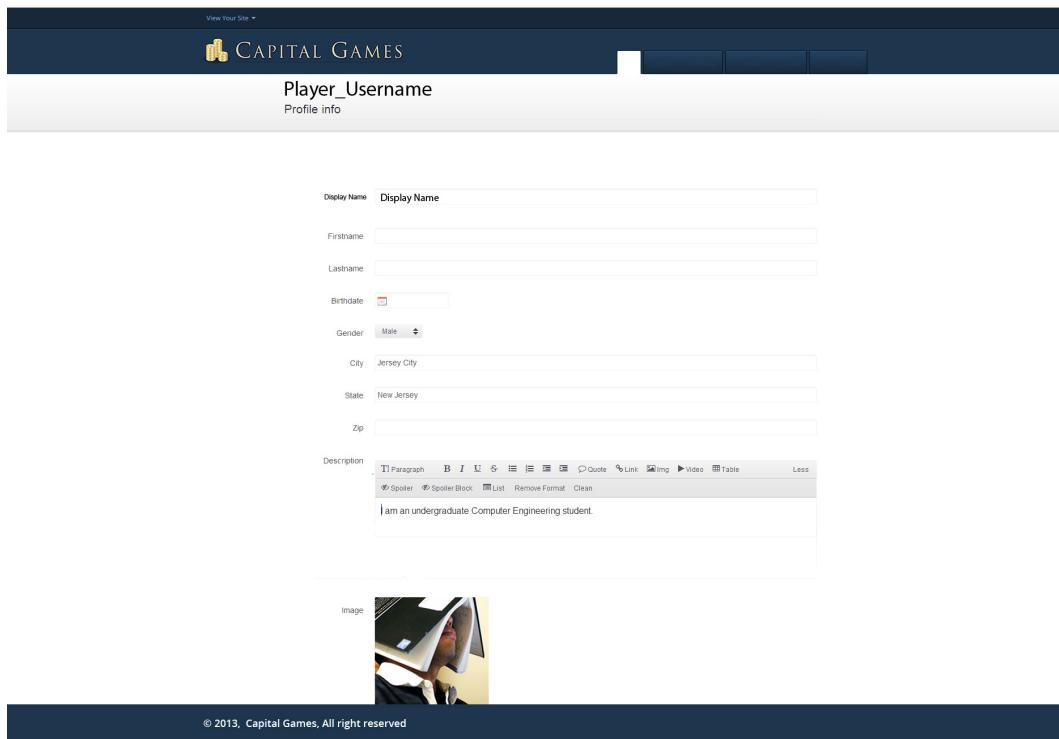


Figure 2.8: Upon clicking the “Edit” button on their portfolio page, users will also be able to manage profile items such as their display name, e-mail address, and other optional information they may choose to disclose, such as their name.

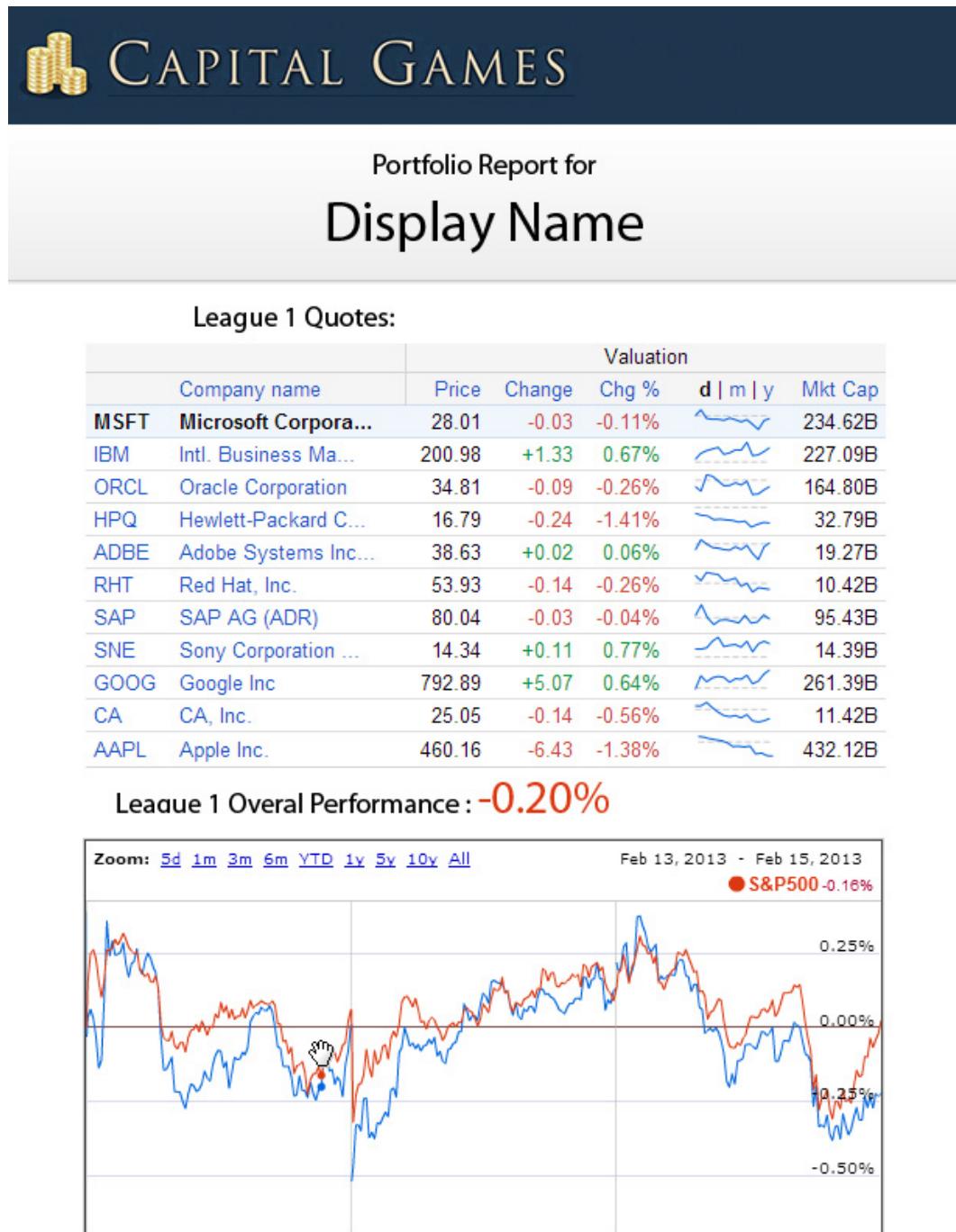


Figure 2.9: Users may choose to view a summary report of a league portfolio, only requiring one click from the portfolio page which would sum to two clicks.

3 Project Management

3.1 Contributions

Category	Points	Names					
		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%