

Rags to Riches

Software Engineering

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[Github Page](#)

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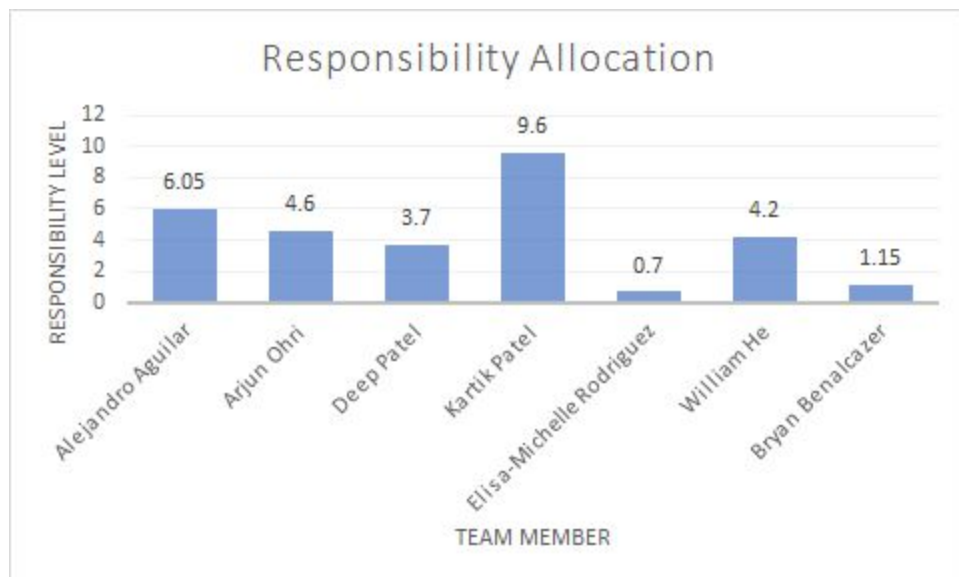
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0 INDIVIDUAL CONTRIBUTIONS BREAKDOWN

0.1 Responsibility Matrix

	Team Members						
	Alejandro Aguilar	Arjun Ohri	Deep Patel	Kartik Patel	Elisa-Michelle Rodriguez	William He	Bryan Benalcazar
Project Management (10 points)	40 %			40 %		20 %	
Sec.1: CSR (9 points)	5 %	30 %	5 %	40 %	5 %	5 %	10 %
Sec.2: System Reqs (6 points)	10 %	15 %	50 %			25 %	
Sec.6: Plan of Work (5 points)	20 %	20 %	5 %	40 %	5 %	5 %	5 %

0.2 Responsibility Allocation Chart



1 CUSTOMER STATEMENT OF REQUIREMENTS

1.1 Problem Statement

Technology has made it very easy to access new information, which allows us to learn new skills with the use of the internet. While the internet does provide quick access to information, the best way to learn something new is with experience.

It is undeniably true that the stock market is an important aspect in our lives because of the influence that shareholders may have on businesses that we interact with everyday. Those familiar with the stock market have learned through their experience how to use the stock market for monetary gains. A lot of uninformed people do not have at their disposal extra income that they could use to invest in the stock market. Likewise, there are people who do not wish to spend a substantial amount of their time in order to acquire the knowledge they need. With the impact the stock market has on our lives, everyone should at the very least have a basic understanding of the key concepts and driving forces behind the stock market and investment management.

While learning by experience is important, an uninterested person will not walk away with the knowledge they sought to acquire. The entertainment industry has evolved to incorporate this very fact with the various historical video games, enjoyable documentaries, and other products being released in recent times. When the educational elements of a product are masked well enough, people will learn the material much more intuitively and will be able to recall it easier at a later date as they will attribute their knowledge to pleasant experiences.

Rags to Riches should serve as an entertaining game while simultaneously supplying an educational aspect intertwined within the game itself. It should inform users of the decision-making process behind exchanging stocks and managing investments as well as the risks and rewards associated with their decisions. The game should retain the user's attention and provide enough entertainment value that the user willingly returns to continue playing and keep educating themselves. The game should track users across sessions thereby requiring user account registration and login.

Tabletop games have been a staple in entertainment even before the rise in technology. Nowadays, many favorites have been ported over to virtual systems and are still being enjoyed in their new form. The game should be modelled after these tabletop games, one such in mind is, *Monopoly*. Games like *Monopoly* are competitive by nature and allow for a user to be hooked into a game with other users. The turn-based system employed by these games naturally provides a moment of downtime for each user allowing the user to take in all the information they can and make the best decisions based on this information. The user should be able to join a queue and wait to be matched into a game against other users or be able to join a game with a group of friends through an invitation.

At the start of a game of *Rags to Riches*, each user should start with the same amount of capital so as to not provide any unfair advantages and be given background information on each of the companies relevant to the game. The game should be set in a detailed fantasy world with fantasy companies and products rather than our real world. This will build on the entertainment factor of the game as users will be dropped in an unknown world to explore.

During the game, the users should be able to perform market orders on the various companies available. The user should be able to make informed decisions based on their opponent's decisions as well as the market trend information provided to the user. Once a user has enough influence over a certain company, they should be able to influence the company into making decisions that have a chance of benefitting the user or hurting other users. There should also be a chat system within the game to allow for users to communicate and interact with one another.

If a user goes bankrupt and is completely out of money, they automatically lose and are removed from the game. If a user reaches the amount of money set as the threshold for winning, they are awarded the win for the game. Each user should be shown a quick overview of the game and any achievements they may have unlocked before the game exits.

Achievements should be stored on user accounts and can be utilized as a way of tracking the user's progress in learning the fundamentals. Once a user hits a certain milestone of progress, they should receive a reward that will unlock new abilities or help them in future games. The user should be able to see their progress towards their next

milestone/reward and the rewards should be valuable enough that the user would want to reach for those milestones.

Along with being able to see their own achievements, the user should be able to see where they stack up against other players of the game as well as see their lifetime stats. Additionally, the user should be provided with basic account management options relevant to most applications. Administrative tools, such as banning users, should be available for those user's with the correct privileges. The user should have the option of integrating their social media accounts with the game so that they can quickly make posts showing off achievements, bragging about a win, etc. By being able to share to social media the user will be able to get validation of their successes from their peers and utilize that to further their progress through future games.

The user should be able to access *Rags to Riches* quickly and easily. With the prevalence of smartphones these days, it makes sense to design an app for the game so that the user is able to play the game with only the minimal number of strokes. As a result of the game being on an app, the user will be able to play the game on-the-go rather than being tied down to a computer. There is an estimated total of 107.7 million android users, by including the ability of sharing achievements via social media the app can become well known and easier to discover. With this increased ease-of-accessibility, *Rags to Riches* hopes to be an entertaining multiplayer turn-based game for the general public, those who do not have extensive knowledge of stock exchanges and investment management.

1.2 Glossary of Terms

Rags – A colloquial term for not having a lot of money. The user starts with “rags” and the objective is to make more money than their opponents.

Riches – A colloquial term for having a lot of money. A user turning their starting capital into “riches” is the objective of the game.

User Groups:

- **Player** – A basic user who participates in a game and has control over their account settings.
- **Opponent** – The opposing user who participates in a game. An “opponent” is also a “player”.
- **Administrator** – A user with additional privileges allowing for the management of basic users, including banning users from the game.

Game – A multiplayer turn-based game set in a fantasy world where the players manage their investments with the end goal of turning their “rags” into “riches”.

Turn – The time where a player can perform actions. Players are able to manage their investments during this time. Opponents can not perform actions at this time.

Bankrupt – A player has no more money remaining. When bankruptcy occurs, the player loses and is removed from the game.

Win – A player successfully turned their “rags” into “riches”. The player reached the threshold set for winning the game.

Loss – A player went into bankruptcy or another player won the game.

Capital – The amount of money each player starts with at the beginning of a game.

Stock – A type of security that signifies ownership in a corporation and represents a claim on part of the corporation's earnings and assets.

- **Ask Price** – Price at which trader will sell a stock
- **Bid Price** – Price at which a trader will buy a stock

Portfolio – An account of all the assets associated with a player in the game. Each player will have their own portfolio.

Investment – The purchase of stocks that are not to be consumed immediately but rather to be used in the future to create wealth.

Order – An investor must place an order to buy or sell an asset.

- **Buy** – An order to purchase an amount of stock.
- **Sell** – An order to sell an amount of stock.
- **Short** – A sell order performed using borrowed stocks.
- **Cover** – A buy order performed to return previously loaned stocks.
- **Limit** – An order that sets the maximum or minimum at which you can buy or sell stocks.
- **Stop** – An order that will only happen at a defined price called the stop price.

Influence – The greater the amount of stocks and percentage a user has in a company, the greater influence they have. Having a large influence in a company provides the user with a greater variety of decisions.

Decision – When it is the user's turn, they can make a decision. Decisions include but are not limited to the buying of stocks, selling of stocks, etc.

Milestone – A set goal that shows the player is making progress

Achievement – A milestone reached by the player resulting in a reward.

Reward – An item unlocked through an achievement.

2 SYSTEM REQUIREMENTS

2.1 Enumerated Functional Requirements

Identifier	Priority	Requirement
REQ-1	5	The system will be easily accessible as a mobile app.
REQ-2	5	The system will allow new users to register accounts.
REQ-3	5	The system will retrieve a user's information when they login to their account.
REQ-4	3	The system will allow users to manage their account: <ul style="list-style-type: none">• Change password• Change contact info• Notification settings
REQ-5	1	The system will allow users to check their lifetime stats and achievements.
REQ-6	3	The system will allow administrators to manage user accounts.
REQ-7	4	The system will provide an initial tutorial interface for newly registered users.
REQ-8	4	The system will allow players to create a private game with custom settings: <ul style="list-style-type: none">• Time allowed per turn• Starting capital• Threshold for winning
REQ-9	4	The system will allow players to invite friends to their private games.
REQ-10	2	The system will allow players to join a queue for a public game with other players.
REQ-11	2	The system will allow users to view detailed information about the companies on the market.
REQ-12	5	The system will automatically determine stock trends throughout the timeframe of the game.
REQ-13	2	The system will allow players to view the current market trends.

REQ-14	5	The system will allow users to initiate market orders: <ul style="list-style-type: none"> • Buy • Sell • Short • Cover • Limit • Stop
REQ-15	3	The system will allow players to influence companies once they have reached the threshold required.
REQ-16	1	The system will allow players to communicate with each other inside of a game.
REQ-17	4	The system will recognize win and loss scenarios for the game.
REQ-18	1	The system will allow users to integrate their social media accounts to post messages to.
REQ-19	1	The system will provide a leaderboard for users to check how they stack up against other players.

2.2 Enumerated Nonfunctional Requirements

Identifier	Priority	Requirement
REQ-14	5	The system will be able to run on Android devices.
REQ-14	4	The system will be lightweight to provide fast performance even on low end devices.
REQ-15	3	The system will have a similar theme across the stock information page, the settings page, and the game page.
REQ-16	4	The system will securely store personal user information.
REQ-17	5	The system will store all data and information in a database with no storage being done on the user's device.
REQ-18	3	The system will allow the user to navigate the app in the fewest number of strokes possible.
REQ-19	3	The system will be active 24/7.

2.3 On Screen Appearance Requirements

Identifier	Priority	Requirement
REQ-20	3	Initial Landing page – This is shown on first boot. The game and its terms are explained here.
REQ-21	5	Registration page – Users will be able to create a new account.
REQ-22	5	Login page – Users will be able to login to an existing account
REQ-23	4	Home Page – Users will be able to create a game, join a game through an invite, or find an online game. They will also be able to manage their settings and achievements.
REQ-24	4	Settings page – Users will be able to change their password, their contact info, their notification settings, and volume.
REQ-25	4	Create A Private Game page – User can create a private game with custom settings: time allowed per turn, starting capital, threshold for winning, etc.
REQ-26	3	Join A Private Game page – User can enter a code given to them by a friend to join an existing private game.
REQ-27	5	Game Page – Users will be able to see their current assets, company information, current game standings, current market trends, each player's wealth, and a button to move on to the next player's turn.

2.3.1 Initial Landing Page



The Initial Landing Page layout is a vertical rectangle containing the following elements from top to bottom:

- Rags to Riches Logo*
- Welcome Screen
- [Log In]
- [Create an account]
- [Information Screen]

2.3.2 Registration Page



The Registration Page layout is a vertical rectangle containing the following elements from top to bottom:

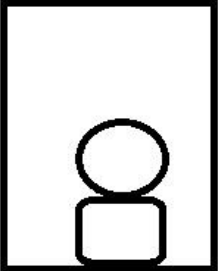
- Welcome, new user! [Back]
- Enter a username:_____
- Enter a password:_____
- Re-enter your password:_____
- Rags to Riches Logo*

2.3.3 Login Page

Please enter

Username: _____

Password: _____



2.3.4 Home Page

(settings icon)

Rags to Riches Logo

Create a New Game

Find a Game

Join a Game

View achievements

2.3.5 Settings Page

Settings

[Change Password]

[Change Account Information]

[Enable Notifications]
[Disable Notifications]

[Mute Sounds]

Rags to Riches Logo

2.3.6 Create a Private Game Page

Create a Game

Room name: _____

Number of players: ____ ▾

Starting currency: _____

Turn duration: ____

Invite friends with this code:

4 Digit Code

2.3.7 Join a Private Game Page


Join a Game

Enter code:

code goes here


2.3.8 Game Page


Basic In-Game Player View Outline

Quit

Next Turn

Currently in ____

Time left



view Standings

View Assets

Cash Money

Net Worth

2.3.9 Stock View

Stock View page in game

Next Turn

Currently in ____

Time left

Name	Value	Buy	Sell	View

Search

Filter

Sort

view Standings

View Assets

Cash Money

Net Worth

2.3.10 Stock Statistics

Viewing a certain stock in-game

Description of company

Back

Name and Ticker

Price per share

Shares

% owned

Total value

value owned

Doing business with:
Company A
US Government
Taliban

Description of relation:
Secretly controls

Commands Depending on Influence in Company

Cease working (50% req?)





Become Private (100%)

Stop working with Company (40% req?)

etc.

2.3.1 Standings Pop-up

View in-game standings popup

Current Rank		Back
 Name	1st	Major stocks: (list 3?)
	Net Worth	Microsoft (MSFT) \$x
	Cash Money	McDonalds (MCD) \$y Child Labour (CLB) \$z
 You	2nd	Major Stocks:
	Net Worth	Silver \$a
	Cash Money	Monster's Inc \$b Another Company \$c
 other guy	3rd	Major Stocks
	Net Worth	General Electric \$u
	Cash Money	Detroit \$v Costco \$w
 insignificant	4th	Major Stocks
	Net Worth	Intel \$20
	Cash Money	Lettuce \$10 KFC \$4

3 PROJECT MANAGEMENT

3.1 Plan of Work

Our plan of work will be dividing into three sub teams, each responsible for a “mini project”. This stack organization is much more effective than a chain organization in that it allows less dependency on other teams and less communication overhead. In turn, this allows for more creative software development.

Our team size is appropriate to develop such an app with this many functionalities. Every member of our team has their own particular strengths, therefore each subgroup will focus on development on a particular functionality of the project. A smaller team would not be able to design and implement a project of this breadth and one that includes this number of features.

The main objective for the next few weeks is to develop the core components of our project. We want to make sure that we have a base build of our project before branching off and developing the additional features. The additional features are to make the game more enjoyable for the user and even though that is important, we need to make sure the barebones version of our app will function first. Each group will be working on the most important aspects of their sections of the project. The specific short term goals of each group are outlined below.

3.2 Group 1: Alejandro and Arjun

The first group in our team will focus on various portions of the project having to do with the user account creation and management, achievements, and social media integration.

User Interfaces: Landing page, Login page, Create Account page, Settings page

Short Term Goals: The plan is to make a skeleton of the framework that will be the account page, settings page, and login page. As well as setup a database that will hold account information securely.

3.3 Group 2: Elisa-Michelle and Bryan

The second group in our team will focus on various portions of the project having to do with creating and joining a private game, joining a public game, leaderboards, and the chat system.

User Interfaces: Create Room page, Join Room page, Leaderboards page, Waiting Room page, and chat UI.

Short Term Goals: The plan is to have basic game creation implemented along with an invitation system for other players.

3.4 Group 3: Kartik, Deep, and William

The third group in our team will focus on various portions of the project having to do with virtual stock simulation, market transactions, and the end-game scenarios .

User Interfaces: User Portfolio page, User Performance pages, Transaction page, and Achievements page, Game page

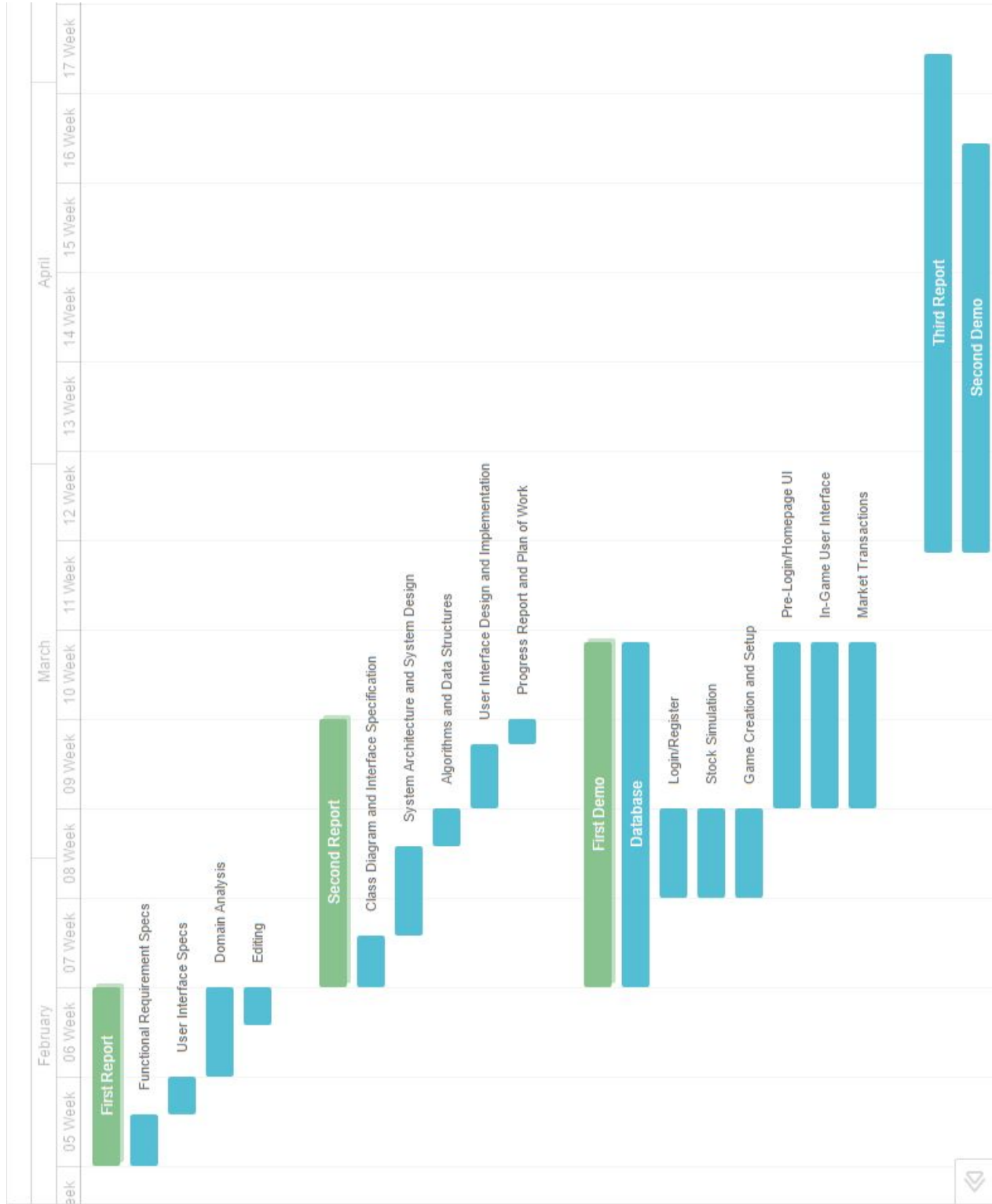
Short Term Goals: The plan is to focus on the storing previous stock information for stock simulations as well as storage and retrieval of user portfolios.

3.5 Measure of Success

The success of the application in educating the user will be determined quantitatively by the user's wealth at the end of the game. If the user was able to increase their wealth from their starting capital, then they demonstrated that they were able to understand and apply good investment strategies.

Furthermore, the amount of achievements a user has gotten also demonstrates the degree to which they understand the investment concepts. If a user is able to reach one of the achievements we have laid out for them, then they will have reached that "checkpoint" of understanding the material, and hopefully continue to reach higher and higher achievements until they have a complete grasp of investment strategies.

3.6 Gantt Chart



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