SE 3XA3: Software Requirements Specification
BigTwo

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Table 1: **Revision History**

Date	**Version**	**Notes**
Feb 9th	0.0	Revision 0
March 3rd	1.0	Revision of the functional requirements.
March 16th	1.1	Revision of the non-functional requirements.
April 4th	1.2	Revision 1
April 11th	1.3	Revision 1 update

1 Project Drivers

1.1 The Purpose of the Project

The goal of this project is to re-implement the classic party game BigTwo with accurate rules and appropriate documentation.The re-implementation of the Game will be for web browsers such that the player can play BigTwo on their own without finding and gathering other players, and also advance their skills in BigTwo.

1.2 The Stakeholders

1.2.1 The Client

The clients of this product are the Teaching Assistants and Instructor of the course SE 3XA3. They are responsible for supervising the project, they have a basic understanding of the project and keep track of the project progress through various milestones, and they will be actively involved in the development process of the project.

1.2.2 The Customers

The customers for the product are the general public of any ages with knowledge of and physical ability to read and understand English, and basic operation of a computer and web browser, who are interested in the BigTwo card game. Customers of this product are also those users who are interested in advancing their skills in this game.

1.2.3 Other Stakeholders

- General Public and Users - These are the main users intended to use the product after release. They require little or no understanding of the project but should be able to use the product.
- Group 6 - As the developers of the game, we hold responsibilities to ensure that this game successfully meets the requirements and goals that are outlined. All members should be involved in various software development phases of this project.

1.3 Mandated Constraints

1.3.1 Product Constraints

In order to use the product, an internet connection and a web browser are required for the user. Mainstream Web browsers that support JS ES6 and HTML5 are required to run the web application. Users also need to remain connected to the internet throughout the entire game after the web page is loaded.

1.3.2 User Constraints

Users and players of the product must have knowledge and physical ability to read and understand English, and basic operation of a computer with mouse/pad and web browser.

1.3.3 Time Constraints

The deadline of this project is April 12, 2021. All the development and documentation of this project should be delivered by the deadline, and this limits the amount of features and compromises product quality on the initial release of the software.

1.3.4 Budget Constraints

There is no budget for this project so all the software and resources used in this project must be free, and this may limits the amount of features and the quality of user experience.

1.4 Naming Conventions and Terminology

- JavaScript - A programming language that conforms to the ECMAScript specification.
- HTML - Hypertext Markup Language (HTML) is the standard markup language for documents designed to be displayed in a web browser.
- CSS - Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language.

- React.js - An open-source, front end, JavaScript library for building user interfaces or UI components.
- Open source - Open source is source code that is made freely available for possible modification and redistribution.
- User interface - The space where interactions between humans and machines occur.

1.5 Relevant Facts and Assumptions

We assume that the users and players of the product have the knowledge and physical ability to read and understand English, and basic operation of a computer with mouse and web browser so no extra instruction or resources of these will be provided during the game.

2 Functional Requirements

2.1 The Scope of the Work and the Product

The software product for this project is a BigTwo game on major web browsers. The BigTwo game will emulate playing the game of bigtwo with 3 computer bots using standard rules. The BigWwo game being implemented will not have multiplayer functionality and no other game functionality beyond BigTwo. The goal of this software system is to allow beginners learn about BigTwo, as well as providing a portable platform for players to play BigTwo on their own in this pandemic situation. The objective that this software system aims to achieve is to provide users with an entertaining and visually pleasing environment to play the game of BigTwo. The benefits that this software system provides to users is that by playing BigTwo in an emulation environment without real money, users can practice BigTwo and learn rules faster.

2.1.1 Deadlines and Deliverables

- Project Approval – January 25
- Problem Statement – January 29

- Development Plan – Feb 5
- Requirements Document Revision 0 – February 12
- Proof of Concept Demonstration – Week of February 22
- Test Plan Revision 0 – March 5
- Design Document Revision 0 – March 18
- Revision 0 Demonstration – Week of March 22
- Final Demonstration (Revision 1) – Week of Apr 5
- Final Documentation (Revision 1) – April 12
  - Problem Statement
  - Development Plan
  - Requirements Document
  - Design Document
  - Test Plan
  - Test Report
  - Source Code

2.1.2 The Context of the Work

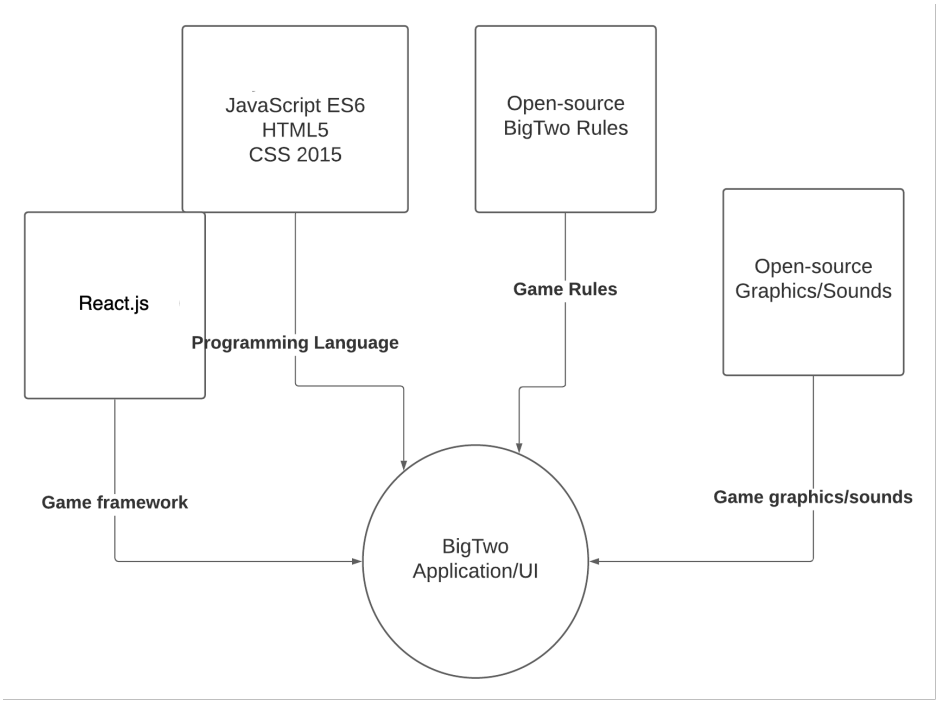

Figure 1: Context the the Work for BigTwo

2.1.3 Work Partitioning

Event Name	Input	Summary
1.Gather rules for standard BigTwo game	Wikipedia	Rules for Standard BigTwo are found on Wikipedia and available to be followed for our implementation of BigTwo
2.Player perform action	HTTP Request	Process player's request and modify game state
3.Computer bot perform action	HTTP Request	Calculate the best move using AI and modify the game state

Table 2: Work Partitioning

2.1.4 Individual Product Use Cases

- A user plays a game of Standard BigTwo.
- A user starts a round.
- The first dealer is picked randomly.
- The user wants to deal out cards singly.
- The user wants to deal out cards as part of combination.
- The user wants to pass.
- The user wants to play again.
- The user wants to exit the game.

2.2 Functional Requirements

FR1. The user must be able to play a game of BigTwo.
Fit Criterion: The user is able to start the game play by clicking the "start" button on the game web page.

FR2. The user interface must allow user to see the game rules before the game starts.
Fit Criterion: The user interface will display the game rules at the start page of the game web page.

FR3. The user interface must notify the user the results of a round.
Fit Criterion: The user interface will display a message to inform the user if they have won or lost, and the score of the player is indicated on the screen for the round.

FR4. The game interface must display the interactive deck of cards the user possesses.
Fit Criterion: The game interface must display the deck of cards the user possesses such that each card can be selected by the user by clicking it.

FR5. The user interface must include an image to represent the background of the game.
Fit Criterion: The BigTwo interface should display an image with a background color to represent the theme of the game.

FR6. The user interface must include a button for the user to indicate their action to deal.
Fit Criterion: The deal Button will appear once the user selects certain cards from their set when it is user's turn after entering the game by clicking the play game button.

FR7. The user interface must include a button for the user to indicate their action to pass.
Fit Criterion: The pass Button will appear once the game proceeds to user's turn after entering the game by clicking the play game button.

FR8. The user interface must display how many cards each other player possesses without revealing actual card sets.
Fit Criterion: Back of card set will be shown on the screen once the user clicks on the play game button.

FR9. The user interface must indicate who is the current dealer.
Fit Criterion: Current dealer will be shown by each player's icon once the user clicks on the play game button.

FR10. The user interface must include a button for the user to indicate their action to play again.
Fit Criterion: The play again button will appear on the screen right below the result and the score after a round finish.

FR11. The user will start the game with STARTING DECK OF CARDS with 4 points and more, point counting rules: J=1, Q=2, K=3, A=4, 2=5, others=0.
Fit Criterion: The user will start the game with a random deck of cards with 4 points and more.

FR12. At beginning of each game, the player with the Diamonds 3 is the first one to deal in first trick.
Fit Criterion: During a game, the player who holds the Diamonds 3 is gets their turn first.

FR13. Play proceeds counter-clockwise, with normal climbing-game rules applying: each player must play a higher card or combination than the one before, with the same number of cards.
Fit Criterion: The player to the right is the next player in turn. Each player can only deal with a valid combination that is higher than the one before, with the same number of cards.

FR14. A trick is over when three players have passed in succession.
Fit Criterion: The interface should notify the user when a trick is over.

FR15. When a trick is over, all cards are gathered up and a new trick is started with all players, initiated by the last player to play.
Fit Criterion: The interface should display the gather up of the cards. A new trick should be started, initiated by the last player to play.

FR16. The game ends when one player runs out of cards, the scoring session will begin automatically.
Fit Criterion: The game should ends when a player has no card in their deck. The game should then proceeds to display scoring session, calculating each player's scores.

3 Non-functional Requirements

3.1 Look and Feel Requirements

3.1.1 Appearance Requirements

1. The product shall display the name of the product and the logo of the company upon starting.
   Rationale: The user should know who designed the game.

2. The product shall have clearly labelled buttons.
   Rationale: The user should know how to play the game.

3. The product shall have a proper size to fit on a web page.
   Rationale: The size of the game should be appropriate to make the user have a good gaming experience.

4. The product shall appear attractive to users.
   Rationale: The game should look interesting to attract potential users.

3.1.2 Style Requirements

1. The product shall generate cards in a clear way.
   Rationale: The messy cards will lower users' interests.

2. The color of the cards shall be distinct from the background.
   Rationale: The user may feel annoying if the color of the cards is too similar to the background

3.2 Usability and Humanity Requirements

3.2.1 Ease of Use requirements

1. The product shall only require the users' mouse for navigating the menu and selecting cards to play the game.
   Rationale: Requirement for mouse is easy to fulfill and will make the game available for a wider audience.

2. The product shall be easy for users with rules of the game provided.
   Rationale: The ease of use will attract more potential users interested in BigTwo.

3.2.2 Personalization and Internationalization Requirements

1. The product shall be provided in English.
   Rationale: English is a universal language.

3.2.3 Learning Requirements

1. The user shall be able to operate a mouse and a web browser.
   Rationale: These are the basic requirements to play the designed BigTwo game.

2. The product shall provide a simple instruction of the game for users.
   Rationale: A simple instruction could help those with no experience in BigTwo to play the game.

3.2.4 Understandability and Politeness Requirements

1. The product shall use an average level of vocabulary.
   Rationale: The user with English background should feel it easy to understand the rules and instructions of the game provided.

2. The product shall be easy for users age 14 and above. Rationale: The teenage users should feel it easy to understand the basic logic of the game.

3.3 Accessibility Requirements

1. The product shall be executable on the majority of computers and web browsers.
   Rationale: The game should be available for most computers and web browser so that more users can have access to it.

3.4 Performance Requirements

3.4.1 Speed and Latency Requirements

1. The product shall respond to each user input within 2 seconds.
   Rationale: The game should not have input lag and make the user have a good gaming experience.

3.4.2 Safety-Critical Requirements

1. The product shall not compromise the user data or computers.
   Rationale: The user should not be worried about the safety of the game.

3.4.3 Precision or Accuracy Requirements

1. The product shall respond to each user input correctly according to the rules of BigTwo game.
   Rationale: The user should feel like they are really playing the game accoring to the rules of BigTwo.

3.4.4 Reliability and Availability Requirements

1. The product shall be available at any time when users have access to a web browser.
   Rationale: The user should always be able to play the game.

2. The product shall never crash.
   Rationale: The game should not crash to make the user have a bad gaming experience.

3.4.5 Robustness or Fault-Tolerance Requirements

1. The product shall not give output if a users gives an undesired input.

3.4.6 Capacity Requirements

1. The product shall not exceed the server load.
   Rationale: If the product exceed the server load, some undesired issues may occur.

3.4.7 Scalability or Extensibility Requirements

N/A

3.4.8 Longevity Requirements

1. The product shall always be functional with a relevant web browser.
   Rationale: The game should be available for most web browser so that more users can have access to it.

3.5 Operational and Environmental Requirements

3.5.1 Expected Physical Environment

1. The product shall be available for any device that has access to a web browser.
   Rationale: The game should be available for most devices and web browser so that more users can have access to it.

3.5.2 Requirements for Interfacing with Adjacent Systems

1. The product shall be available for any device that has access to a web browser.
   Rationale: The game should be available for most devices and web browser so that more users can have access to it.

3.5.3 Installability Requirements

N/A

3.5.4 Release Requirements

1. The new release of the product shall not cause the previous version to fail.
   Rationale: The user should be able to update his local files of BigTwo if they want to.

2. The product shall be updated if there are some errors or bugs upon realization.
   Rationale: The bugs of game should be fixed to enable the user to play the game.

3.6 Maintainability and Support Requirements

3.6.1 Maintenance Requirements

1. The product shall undergo revision yearly.
   Rationale: The game shall undergo revision to check for any potential bugs.

3.6.2 Supportability Requirements

1. The product shall be available for the majority of the web browsers.
   Rationale: The game should be available for most web browser so that more users can have access to it.

3.6.3 Adaptability Requirements

1. The product shall be compatible with the majority of the web browsers.
   Rationale: The game should be available for most web browser so that more users can have access to it.

3.7 Security Requirements

3.7.1 Access Requirements

1. The source code of the product shall be only authorized for developers.
   Rationale: The user should not be able to change the source code of the game.

3.7.2 Integrity Requirements

1. The product shall not accept incorrect user data or user input.
   Rationale: The user should not input from devices like video game controllers

3.7.3 Privacy Requirements

1. The product shall not require any personal information from users.
   Rationale: The user should not be worried about the safety of the game.

3.7.4 Audit Requirements

1. The product shall be audited yearly.
   Rationale: The game shall be audited to deal with any issues happened.

3.7.5 Immunity Requirements

N/A

3.8 Cultural Requirements

1. The product shall not use any words or graphics that are offensive to people with any culture.
   Rationale: The game should respect every user with any culture.

3.9 Legal Requirements

3.9.1 Compliance Requirements

1. The product shall not violate any laws.
   Rationale: The game should be legal.

3.9.2 Standards Requirements

1. The product shall follow the MIT Open License.
   Rationale: BigTwo should follow the MIT Open License as the original project does.

3.10 Health and Safety Requirements

1. The product shall prevent users from game addiction.
   Rationale: The user should not get harm due to the game.

2. The product shall not involve any gambling elements.
   Rationale: The game should not have any gambling elements to mislead the teenage users.

4 Project Issues

4.1 Open Issues

Understanding of code structure of existing open-source project found on GitHub.

- The original project on GitHub was implemented in Java. We will analyze and re-implement the modules in JavaScript.

4.2 Off-the-Shelf Solutions

4.2.1 Existing Products

There are many existing products for that have created the game of BigTwo. They are listed below:

- Play Big Two Cards Game Online (http://www.onlinesologames.com/bigtwo)
- Big 2 - Card Game - GamsSlush (https://www.gameslush.com/big-2)
- Play Big2 online - PlayDOSGame.com (https://www.playdosgames.com/online/big2/)

There are many other variations of BigTwo Game found online. We are going to investigate these ready-made products, find the advantages and drawbacks in their designs, and then improve our design and implementation.

4.2.2 Ready Made Components

N/A

4.2.3 Reusable Components

N/A

4.2.4 Products That Can Be Copied

As an open source project the original implementation can be relied upon as a reference.

4.3 New Problems

4.3.1 Problems in Current Environment

The new game will be running on a website. If the server hosting the website is crashed, then the the game can not run on the website.

4.3.2 Effects on the Installed Systems

This interface stand alone on and does not coexist with an older system.

4.3.3 Existing Users

Some potential user problems as an adverse reaction from playing our project are eye soreness and eye strain from extended playing.

4.3.4 Limitations in implementation environment

N/A

4.3.5 Follow Up Problems

If we one of the developers leave the team, there will be a gap in the information of how the product is implemented. There are also adverse risks if the software becomes too outdated for new upcoming web browsers and technology.

4.4 Tasks

4.5 Migration to the New Product

4.5.1 Requirements for Migration to the New Product

N/A.

4.5.2 Data That Has to Be Modified or Translated for the New System

N/A

Name	Begin date	End date
Project Approval	1/25/21	1/25/21
Problem Statement	4/12/21	4/12/21
Final Demonstration(Revision 1)	4/12/21	4/12/21
assign development plan tasks	2/3/21	2/3/21
Technology	2/4/21	2/4/21
coding style	2/4/21	2/4/21
Project schedule and review	2/4/21	2/4/21
Development Plan	2/5/21	2/5/21
Assign SRS	2/8/21	2/8/21
SRS part 1	2/8/21	2/9/21
SRS part 2	2/9/21	2/10/21
SRS part 3	2/9/21	2/10/21
Requirements Document Revision 0	2/12/21	2/12/21
POC Demo Initialization	2/15/21	2/15/21
POC Demo Brainstorming	2/16/21	2/17/21
POC Demo Script	2/18/21	2/22/21
POC Slides	2/22/21	2/23/21
Proof of Concept Demonstration	2/26/21	2/26/21
Test Plan Initialization	3/1/21	3/1/21
Test Plan brainstormation	3/2/21	3/3/21
Test Plan part 1	3/3/21	3/3/21
Test Plan part 2	3/4/21	3/4/21
Test Plan Revision 0	3/5/21	3/5/21
D&D Initialization	3/8/21	3/8/21
D&D Assign	3/9/21	3/9/21
D&D part 1	3/10/21	3/12/21
D&D part 2	3/11/21	3/15/21

Figure 2: Tasks generated by GanttProject

Name	Begin date	End date
D&D part 3	3/12/21	3/16/21
Design&Document Revision 0	3/18/21	3/18/21
Project code revision 0	3/19/21	3/24/21
Prepare for demo	3/23/21	3/25/21
Revision 0 Demonstration	3/26/21	3/26/21
Improvising Docs	3/29/21	4/2/21
Testing and fixing code	3/29/21	4/2/21
Final Demonstration(Revision 1)	4/5/21	4/5/21
Peer Eval of Other Teams Final Demo	4/5/21	4/5/21

Figure 3: Tasks continue

4.6 Risks

Testing is a risk that must be assessed. The integration testing of the game may be difficult to automate because the program is a game. It requires testing that relies heavily on user testing which is not efficient.

4.7 Costs

None as long as the software and other resources used in this project is free.

4.8 User Documentation and Training

4.8.1 User Documentation Requirements

N/A

4.8.2 Training Requirements

N/A

4.9 Waiting Room

Additional functionality of the game and visual as well as audio effects.

4.10 Ideas for Solutions

Proper hierarchy and documentation of JavaScript code for the game and JavaScript, HTML, CSS code for the web interface.

5 Appendix

N/A

5.1 Symbolic Parameters

N/A

References