Requirements Document

December 9, 2015

SE 2XA3

Hui Chen	chenh43
Nareshkumar Maheshkumar	maheshn
Sam Hamel	hamels2

Group E

Revision History

Table 1: Revision History Table

Developer	Date	Change	Revision
Hui Chen	Dec 8 2015	Revised section 5 in the Test Report Document	17
Nareshkumar Maheshkumar	Dec 8 2015	Revised 2,3, 4.2.4, 4.2.5, 8, 9, 15 and 16 in the Design Document	16
Hui Chen	Dec 8 2015	Revised section 2.1, 2.2.2, 2.2.3 in the Test Plan Document	15
Hui Chen	Dec 8 2015	Revised Non-functional Requirements in the Requirements Document	14
Nareshkumar Maheshkumar	Dec 4 2015	Revised 3.4, 4.8 and 5.8 in the Requirements Document	13
Hui Chen	Dec 2 2015	Revised: Fixed the numbering in 3.3 and 3.4 in the Requirements Document	12
Sam Hamel	Dec 2 2015	Revised: Number the Functional Requirements in the Requirements Document	11
Hui Chen	Oct 10 2015	Final Edit	10
Nareshkumar Maheshkumar	Oct 9 2015	Final Revision	9
Hui Chen	Oct 9 2015		8
Sam Hamel	Oct 9 2015		7
Hui Chen	Oct 7 2015		6
Sam Hamel	Oct 7 2015		5
Nareshkumar Maheshkumar	Oct 7 2015		4
Sam Hamel	Oct 5&9		3
Nareshkumar Maheshkumar	Oct 3&9 2015		2
Hui Chen	Sept 29 2015	Created requirements document	1

Contents

List of Figures

List of Tables

1 Project Drivers

1.1 The purpose of the Project

The purpose of the project is to design and develop a Texas Hold-Em game that a person can play for enjoyment and improvement of their skills by getting the user acquainted with the rules of the game through gameplay, and by facing a challenging computer opponent. There are too many people who do not know the basics of the game and the goal is to help those who need a way to learn the game before entering their first professional Texas Hold-Em game, for example at a casino.

1.2 The Client, the Customer, and Other Stakeholders

Client

- Spencer Smith

The Customer

- Windows, Macintosh OS X, and/or Linux users

Other Stakeholders

- Supervisors
- Designers and Developers
- Testers
- End Users

1.3 Users of the Product

The users are beginner Texas Hold-Em players who wish to learn how to play the game. It is assumed they have no prior knowledge of the game. Users of any operating systems are accepted whether it is Windows, Macintosh OS X, or Linux users.

2 Project Constraints

2.1 Mandated Constraints

The current project constraint states that the product must be completed within the span of three months. The product shall be implemented in a GUI for simple navigation. The final product shall be self contained and be able to run on any major operating system (Windows, Macintosh, Linux). The product shall be marketed toward gamers, and/or poker players. The source code shall be written entirely in Java, and uses the awt and swing libraries from Java.

2.2 Naming Conventions and Definitions

- Texas Hold-Em - (also known as Texas holdem, hold 'em, or holdem) is a variation of the standard card game of poker.
- No limit - Game in which there is no maximum amount of money or chips that a player is permitted to wager.
- GUI - Graphical User Interface
- Heads up - A game of poker between just two players.
- Call - To accept the opponent's bet
- Raise - To make an additional bet of chips on top of the existing bet
- Check - To pass on betting
- Fold - If you fold your hand in poker, you lay down your cards and stop playing the hand. You forfeit the round.
- All in - Having all of one's chips at stake in a particular hand. Having one player all-in does not prevent future action by other players. Any future wager or portion of a previous wager that the player is not able to call goes into a side pot that the non-contributing player is not eligible to win.

2.3 Relevant Facts and Assumptions

Relevant Facts

- Performance will vary according to the user's computer specifications
- Gameplay experience will vary due to the random shuffle algorithm

Assumptions

- The users are assumed to be beginners, as our version of the game will not cater to professional players
- Most users are assumed to be familiar with the operating system of their choosing for the usage of the product
- Most users are assumed to have the minimum memory and specifications in order to run the game on their personal computing device

3 Functional Requirements

3.1 The Scope of the Work

3.1.1 Current Situation

There are many aspiring poker players in the world today who just wants to play a game of Texas Hold-Em, so in pursuit of this goal, they will need practice and experience. There are too many people who do not know the basics of the game and our product is meant for beginners and experienced players alike, providing experience without the need of monetary sacrifice. The game is built to enhance skills or to discover something new. The game is aimed to simplify the game as much as possible so a beginner will have no problem getting into the game and they can play for enjoyment and improve their skills by getting them acquainted with the rules through gameplay and by facing a challenging computer opponent. The goal is to help the players learn the game before entering their first professional Texas Hold-Em game, for example, at a casino.

3.1.2 Context of Work

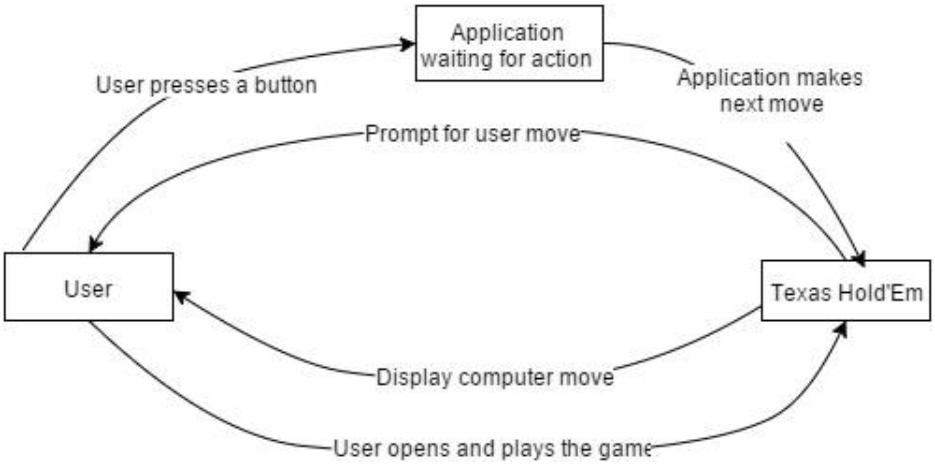

Figure 1: Work Context Diagram

3.2 Business Data Model & Data Dictionary

N/A

3.3 The Scope of the Product

3.3.1 Product Use Case

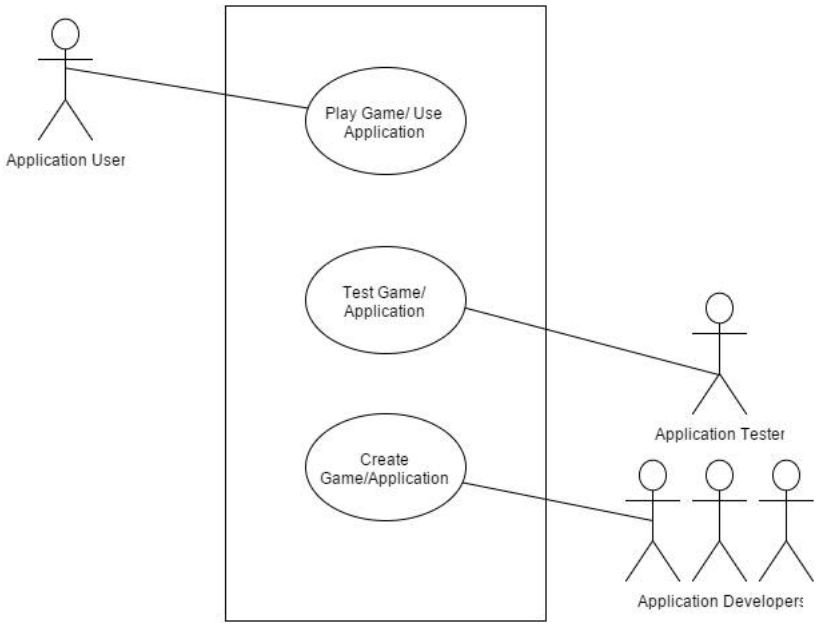

Figure 2: Use Case Diagram

3.4 Functional Requirements

The system shall:

1. have a help page that the user can click on to explains the rules of the game. The page should be accessible at anytime during the game, should have all the basic rules of the game, all the card hands ranked in order of strength, and extra tips and tricks.

2. Have a GUI that the user will use to start the game and play which includes:

   - a start menu with the option to view the help page, start a new game and quit the game
   - a game view which shows the user their hand with, and the board cards with graphical images of the cards. It will also show the

amount of chips the player and computer have, ~~allow the user to save after each round,~~ and have a way to access the help page at any time via button or other means.

3. have a computer program that can play Texas Hold-Em against the user, this computer program shall be able to:
    - bet, raise, call, check and fold
    - keep a count of the number of chips it has and the player has
    - evaluate and measure hand strength
    - calculate the probability of winning a round based on the hand its given
    - make actions based on the probability of winning/losing
4. be able to start a game, distribute cards, and monitor chip counts
5. pit the player against a computer opponent in a match of heads up no limit Texas Hold-Em
6. be able to distribute cards to the player, computer and board. The distribution of these cards should appear random and not follow any discernible pattern
7. be able to ~~save the game, and~~ end a game once either the player or the computer run out of chips
8. Set the default number of chips to 1000 for the player and computer at the start of the game
9. monitor and adjust chip count after each round
10. end the game when either player or computer loses all their chips

4 Non-Functional Requirements

4.1 Look and Feel Requirements

Appearance Requirements

- APP1: The interface should be intuitive for beginners and the look should feel familiar to users of any operating system
- APP2: The overall look should be clean and uncluttered

Style Requirements

- STY1:The user interface of the game should be appealing enough for the user to continuously want to play the game

4.2 Usability and Humanity Requirements

Ease of Use Requirements

- USE1:The interface should be easy for a beginner player to start playing immediately after reading the rules section of the program
- USE2:The interface shall be intuitive and easy to navigate

Ease of Learning Requirements

- LRN1:The rules section should be clear and concise so that someone with no prior knowledge can understand
- LRN2:The user interface should contain objects in an organized and uncluttered manner for ease of gameplay.

4.3 Performance Requirements

Speed requirements

- SPD1:The game should load within 3 seconds after execution
- SPD2:The computer player should respond within 2 second
- SPD3:Button action(s) should be performed immediately
- SPD4:The game graphic should refresh every 1 seconds (1Hz)

Safety and Critical requirements

- N/A

Precision Requirements

- PSN1:The computer player should calculate probabilities accurate to 4 decimal places
- PSN2:The deck shuffling should be as random as possible

Reliability and Availability Requirements

- RAA1:Should be available on any operating systems (Windows, OS X, Linux)
- RAA2:Should be available until program closes

Capacity Requirement

- CAP1:The program shall be played by a single user on a single machine

4.4 Operational and Environmental Requirements

Expected physical environment

- EPE1:The program shall be used by a single user in any environment the user wishes

Expected Technological environment

- ETE1:The program shall run on any machine that has java
- ETE2:The program is an offline application and needs no Internet connection to run

Partner Applications

- N/A

4.5 Maintainability and Support Requirements

Ease of Maintainability

- EOM1:The program does not need to be maintained once development has been completed

Portability requirements

- POR1:The product is expected to run under the Windows, Apple and LINUX operating systems.
- POR2:The product should not be resource intensive

4.6 Security Requirements

- N/A

4.7 Cultural Requirements

- CUL:The program shall not use icons that could be considered offensive in any of our market countries.

4.8 Legal Requirements

- LEG1:The program shall deal with only virtual currency
- ~~The program will have a disclaimer stating that it does not advocate illegal gambling and should not be used as a tool to do so~~

5 Project Issues

5.1 Open Issue

- Should the program include an AI that does more than read probabilities for the user to play against, if so how well should it play
- It is difficult to test a GUI element
- Is a pseudo random deck shuffler sufficient for the game or is a truly random method needed for shuffling the deck

5.2 Off-the-Shelf Solutions

- There are a multitude of applications on computers and phones that allow people to play Texas Hold-Em against other or against a computer.
- A no limits heads up Texas Hold-Em computer algorithm has already been developed by the University of Alberta
- Texas Hold-Em manuals already exist to help beginners learn the game quicker

5.3 New Problems

N/A

5.4 Tasks

- Revise requirements document
- Create a Test Plan Revision 0
- Demonstration for Proof of Concept
- Design Document Revision 0
- Demonstration of product Revision 0
- Document a Users Guide
- Generate Test Report
- Demonstration of final product
- Revise the documentation

5.5 Migration to the New Product

N/A

5.6 Risks

Product Related Risks:

- Computer crashes while the user is playing the game
- pseudo random deck shuffler seems to generate discernible patterns the user can spot
- games take too long for the user to win/lose

Contingency plans:

- The program will save the game after every round of hands played so that if any crashes happen the user can return to play from the previous hand dealt
- Find a randomization algorithm with a sufficiently high complexity so that a human can't spot patterns
- After a set duration of time, the user will be forcefully asked to fold, and if the game proceeds even further, the user will be asked to go all in.

Production related risks:

- Scope of project is too large for complete development of the program in the time period given
- proving correctness of the program will be difficult if not impossible
- Testing of Look and Feel Requirements plus Usability and Humanity requirements may not be viable due to lack of resources and time

Contingency plans:

- Develop a Prototype of the program for proof of concept, if development of the prototype is deemed too difficult, re-evaluate the scope and requirements of the project
- If proof of correctness is deemed too difficult or impossible, run various testing methods until all developers believe the program is error free
- If Testing of Look and Feel Requirements and Usability/Humanity requirements is not possible in the time frame given the subjective properties will be judged by either the developers themselves and/or by any acquaintances of said developers

5.7 Costs

There are no monetary costs involved with this projects, but about 12 weeks of development time be required.

5.8 User Documentation and Training

There will be a Game Rules and "App Info" option in the program which will provide the user with information about the rules, key terminology and guidelines to play the game. Users who are already familiar with their operating system should not require further training to understand the game.

5.9 Waiting Room

Currently there are no plans for future release of the product. In the case that a new release is planned, features such as online capabilities and allowing more players or computer opponents to play in a single game.

5.10 Ideas for Solutions

Development of the game and GUI will be done in Eclipse.