Ticket to Ride — Project Requirements Document

Project Description

We will build a web version of the classic board game *Ticket to Ride*. Our game will include extra features such as chat rooms, Artificial Intelligence, and Leaderboards. We will work in conjunction with Ken Rodham for this project.

Project Purpose

The purpose of this project is to provide the foundation for the newest class project for CS340 at Brigham Young University. This will include providing time and difficulty estimations as well as a final product that can be used as the demo for the class.

Timeline - *Milestone details found below requirements list*

Milestone	**Deadline**
Login/Register complete	February 27, 2016
Game Lobby complete	March 9, 2016
Ability to Play Game	April 5, 2016
Alpha Release	April 12, 2016

Requirements

Functional Requirements

F.1. *User accounts*
- F.1.1. User can register new account
- F.1.2. User can login to existing account
- F.1.3. User can logout of account

F.1.4. User can see game stats

F.2. *Pre-game set up (game lobby)*

F.2.1. User can create a new game

F.2.2. User can join an existing game

F.2.3. User can re-join a game already in progress

F.2.4. User can add AI players to his or her game

F.2.5. User can start the game, either manually or with auto start

F.3. *In game play*

F.3.1. User can change between all the games they are currently playing in

F.3.1.1. User can play multiple games at the same time. Thus, while they are waiting for others to take their turn on one game they can switch to another game and continue playing the game. This will elevate the user experience and keep users playing for longer periods of time.

F.3.2. User can chat with other players in the game they are currently playing

F.3.3. User can see game history

F.3.3.1. Whenever an action is performed in the game it will be recorded and displayed on the screen. This will allow a user who has left (either switching between games or by logging out) to see what has happened in the game.

F.3.4. User can view map of routes

F.3.5. User can buy a route on the map

F.3.6. User can obtain destination cards

F.3.7. User can view and draw train cards

F.3.8. User can leave a game

F.3.9. User can logout during game play

F.3.10. User can view current scores of all users in the game.

F.3.11. Enforce the rule that a user cannot buy an adjacent route without 4+ players in the game.

F.4. *Miscellaneous*

F.4.1. User can view leaderboard of all players and games

F.4.1.1. Whenever a game finishes the game standings will be recorded. This data can then be viewed on a Leaderboard page showing how each user ranks compared to other users in the system.

F.4.2. Data is persisted so that in the event of a server crash nothing will be lost.

User Interface

U.1. *Web app*

U.1.1. A responsive and sleek web app using the AngularJS framework, HTML, CSS and Bootstrap. This will allow for easy transitions between different parts of the game and game lobby.

U.2. *Native Android app*

U.2.1. Easily playable from wherever an individual is currently located. For that reason we plan to build a native Android app.

U.3. *Native iOS app*

U.3.1. For the same reason, we want to also create a native iOS app.

Technical Requirements

T.1. *Websockets to relay information between server and client*

T.1.1. We will use websockets to communicate any new data between the server and client. This includes information about new games that are created, a player joining a game, and even events that occur during game play. This will allow for a quick interaction and low lag time between different connected users.

T.2. *HTTP server to serve HTML, CSS, JS and any other resource files from the server*

T.2.1. The files that are needed to run the program need to be transferred from the server, where they are stored, to the user's browser. Since we intend this to be played via the web and a web browser, it is essential that the server have this ability.

T.3. *Persistent data backup*

T.3.1. We will use a NoSQL database to backup all the game data. The specific actions a user plays will be backed up as they are executed on the server. The entire game will be backed up every 10 operations.

T.4. *API for communication between client and server*

T.1.1. To facilitate the communication between client and server we will produce an API that both sides will use.

T.5. *The game will be fully functional in the latest versions of Chrome and Firefox*

Minimal Viable Product / Semester Goal

MV.1. Req. T.1 (Websocket connections)
MV.2. Req. T.2 (Access to server resources by the client)
MV.3. Req. T.4 (API for communication between client and server)
MV.4. Req. F.1 (Users can login/register and logout)
MV.5. Req. F.2.1 (Users can create a new game)
MV.6. Req. F.2.2 (Users can join a game)
MV.7. Req. F.2.3 (Users can return to a previous game)
MV.8. Req. F.2.5 (User can start a game)
MV.9. Req. F.3.3 (Users can see a game history)
MV.10. Req. F.3.4 (User can view map of routes)
MV.11. Req. F.3.5 (User can buy routes)
MV.12. Req. F.3.6 (User can get destination cards)
MV.13. Req. F.3.7 (User can draw train cards)
MV.14. Req. F.3.9 (User can logout in the middle of a game)
MV.15. Req. F.3.10 (User can view scores and status of players in the game)

Secondary Features

S.1. Req. F.3.8 (Users can leave a game)
S.2. Req. F.3.2 (Users can communicate via in-game chat)
S.3. Req. F.3.1 (Users can switch between games without logging out)
S.4. Req. F.3.11 (Users cannot purchase adjacent tracks without 4+ players)
S.5. Req. F.4.1 (Users can view a leaderboard that keeps track of key statistics)
S.6. Req. F.4.2 (Database persistence)
S.7. Req. F.2.4 (Artificial Intelligence can be played against)

Milestone explanations

The following requirements from the Minimal viable product are included in:

Login/Register Milestone

1. MV.1
2. MV.2
3. MV.3
4. MV.4

Game Lobby complete

1. MV.5
2. MV.6
3. MV.7
4. MV.8

Ability to play the game

1. MV.9
2. MV.10
3. MV.11
4. MV.12
5. MV.13
6. MV.14
7. MV.15

Project Constraints

Time Constraints

The project will need to be completed before the end of April 2016 in order to facilitate a reasonable time expectation for students. A completed product will be needed before August 2016 in order to provide students with an example to reference.