**Admiral Radar: Space Expedition**

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**Problem Statement**

Board games are a lost art, and part of a treasured history. By adapting the popular board game *Captain Sonar*, we attempt to digitize the game and open it to a wider audience through online play, more intuitive gameplay, and additional functionalities not possible on a physical board. *Admiral Radar: Space Expedition* allows players to enjoy the gameplay mechanics originally found in *Captain Sonar* but without the need for players to be in the same geographic location. Some game features are simply not even possible in physical board games such as team-only communication, persistent player statistics, or single player gameplay, demonstrating the need for board games such as *Captain Sonar* to be brought into the digital space.

**Background Information**

We plan for our game *Admiral Radar: Space Expedition* to be a digitized counterpart of the board game, *Captain Sonar* with the inclusion of certain popular features expected from computer games. These features include online multiplayer, user accounts to track skill progress and game history, offline play with a CPU controlled opponent, enhanced gameplay, visual and audio feedback, as well as a webapp version along with a desktop app one.

*Captain Sonar* along with many other board games don’t have as much of a chance to shine in the spotlight due its eclipsing in popularity from video games. A game like this has huge entertainment potential if properly ported to a more complex, convenient and popular platform, specifically on the computer. The enhanced complexity of the computer platform can allow for this game’s shortcomings to be eliminated.

There has been significant prior work in this area in the form of efforts to computerize various board games. The most familiar example of such work may be the video and computer game versions of the board game *Monopoly*. The experience provided by such app is generally high-quality, however is limited to that specific game. More complicated, less universally known games are less frequently converted into applications. BoardGameArena.com is a website which hosts multiple different types of games, however has a lackluster interface and few features available for cooperative games. We intend to develop our game on a more user friendly GUI and implement all the features associated with it.

*Captain Sonar* is a board game released in 2016 that provides an engaging mechanic for team building and cooperative play. In the game, players form teams of up to four and assume various roles onboard a submarine. The captain steers the submarine, the radio officer determines the location of an enemy submarine, the first mate ensures that sensors and weapons will be ready to be used, and the engineer fixes broken systems. Each movement of the submarine is accompanied by actions from each team member, which together comprise one game turn. In an interesting twist, the turns for each independent team may occur at different rates: that is, each team’s turn is not dependant on the others’. Such a game structure, called a “real time” board game, is uniquely fun and engaging while an exceptional promoter for teamwork. Our project will thus use the mechanics and rules from *Captain Sonar* while using a space-based backstory and visual theme.

**Requirements (Backlog)**

## ***Functional Requirements***

**General**

1. As a user, I would like to be able to login using an id and password
2. As a user, I would like to be able to have an avatar and customize my profile
3. As a user, I would like to be able to start, join, and end a game when I like
4. As a user, I would like to be able to select a team and position on my team
5. As a user, I would like to be able to select a map from variety of maps
6. As a user, I would like to be able to play on a turn based mode
7. As a user, I would like to be able to have a second mode of playing: real-time
8. As a user, I would like to be able to text chat with my teammates in-game
9. As a user, I would like to be able to perform the actions required for a spacewalk
10. As a user, I would like to be able to play the game entirely online, without a desktop client
11. As a user, I would like to be able to play with less than four players by having the computer take over a role

**Captain**

1. As a user, I would like to be able to send directions to navigate the spaceship
2. As a user, I would like to be able to know when a special ship system is ready
3. As a user, I would like to be able to fire a rocket, drone, the radar, or mines.
4. As a user, I would like to be able to deploy the ship’s boosters.
5. As a user, I would like to be able to fire a remotely-detonated mine.
6. As a user, I would like to be able to know when a system is disabled
7. As a user, I would like to be able to get information about the enemy spaceships supposed position from the radio operator
8. As a user, I would like to be able to begin a spacewalk.
9. As a user, I would like to be able to see where my team has laid mines

**First Mate**

1. As a user, I would like to be able to charge a system on every move
2. As a user, I would like to be able to deploy the Sonar or a Drone.
3. As a user, I would like to be able to monitor the total health of the ship

**Engineer**

1. As a user, I would like to be able to keep track of which systems are disabled and which get repaired
2. As a user, I would like to ask the captain to follow a certain course to repair a system
3. As a user, I would like to select a component to be disabled after a movement.

**Radio Operator**

1. As a user, I would like to be able to get the courses of enemy spaceships
2. As a user, I would like to be able to click on different areas and plot supposed paths
3. As a user, I would like to be able to keep tracks of mines – both ours and enemies
4. As a user, I would like to be able to advise captain on when to deploy mine
5. As a user, I would like to be able to keep track of disclosed locations of enemy
6. As a user, I would like to be able to adjust predicted enemy courses based on information received

**Developer**

1. As a developer, I would like to be able to make a separate server
2. As a developer, I would like to be able to store game information in server
3. As a developer, I would like to be able to communicate between server and client
4. As a developer, I would like to be able to have a database for user profile
5. As a developer, I would like to be able to have accomodation for real-time play

## ***Non-Functional Requirements***

1. As a Player, I would like to keep GUI input delays low.
2. As a Player, I would like all communications (text chat, notifications, etc.) between clients and the server to have low latency, especially in real-time mode, for enjoyable gameplay.
3. As a Player I would like the audio feedback to be synced with the visuals.
4. As a Developer, I would like the server to receive all inputs from each of 4 clients before executing the team’s move.
5. As a Developer, I would like each team’s clients to only receive information that they are entitled to know. (e.g. they should not receive the other team’s location)
6. As a Developer, I would like each player’s client to be distinct and separate. No player role should be able to perform actions of other team members for them.
7. As a Player or Developer, I would like the game to be capable of handling more than 2 teams (8 players) (if time allows).
8. As a Player or Developer, I would like communications with the login server to be encrypted and secure. Each player should only be able to access their own account.