

1. Introduction

1.1. Aim of the document

The aim of this SRS document is to provide a detailed overview of Clarity, its parameters, and goals. This document describes the project's target audience, hardware, and software requirements. It defines how our client, team and audience see the product and its functionality as well as aiding in the development of the project.

1.2. Overview of the defined system

We are designing a survival based computer game. The objective of the game is to dodge enemies attacks while finding your way through a procedurally generated maze. The player will be able to unlock special abilities to help them progress through the increasingly difficult levels. The game will gradually become darker as you get closer to the goal.

1.3. Stakeholders

The stakeholders in the project are: our group, Professor Falessi, and students interested in playing our game.

1.4. Operational settings

It will be shipped as a desktop application targeting any system which supports Java 8 or newer.

1.5. Related systems

Some related systems would be tower defence games. The difference is that it adds a twist to it where instead of building a defence, you build an offence to get through the defence. The pros of the game is that it allows more flexible gameplay. The cons are that instead of a static defence game, it dynamically changes constantly which increases the learning curve. Another related system would be linear 2d side scrolling games. The difference is that instead of going just one direction to reach the end goal, the maze will make the gameplay more complex. One benefit is that it allows more user control in the game since it won't be linear. One disadvantage is that it'll take longer to develop.

2. User Stories

1. As a beginner player, I want a tutorial level, so I can easily learn how to play the game.
2. As an advanced player, I want at least 10 hours of gameplay, so I can have fun.
3. As a gamer, I want an endless game mode, so the game will have replay value.
4. As a player with limited time, I want to save my progress, so that I can continue playing where I left off.
5. As a developer, I want to have access to a test level, so that I can verify that all the game mechanics function according to the documentation.
6. As a user, I want to listen to an upbeat soundtrack, so that I am more engaged with the the game.
7. As a veteran user, I want to view my accomplishments as I progress, so that I have goals to beat.
8. As a beginner, I want to play the game with instructions, so that I know how to get to the next level.
9. As a game player, I want to pause the game at any time, so that I can step away and resume later.
10. As an advanced user, I want the levels to increase in difficulty, so that the game remains interesting.
11. As a user, I want to gain new abilities, so that I can cope with the increasingly difficult levels.
12. As a player, I want to gain power ups throughout the game, so that I can get through the game more easily.
13. As a player, I want to move in more than one direction, so that I can dodge the enemies.
14. As a player, I want to receive a visual cue if I'm going in the correct direction, so that I save time.
15. As a tester, I want a sandbox mode, so that I can replicate situations for debugging.
16. As a player, I want the option to modify controls, so that I have comfortable controls.
17. As a player, I want to have a score system, so I can see if I improve.

18. As a player, I want a custom game option that allows me to make my own level.

3. Functional Requirements

1. The system shall display a percentage-based indicator of progress.
2. The system shall display the player's current health and strength at all times.
3. The system shall display the current system time when the game is paused.
4. The system shall introduce the basic mechanics to a new player through a tutorial level.
5. The system shall provide additional details about game mechanics through a series of written instructions.
6. The system shall display the user's score upon completion of each level.
7. The system shall react to user input.
8. The system shall display a message when a player loses a life.
9. The system shall have multiple levels.
10. The system shall update the user scoreboard when a higher score is achieved.
11. The system shall display the possible controls for a new user at the start of the game.
12. The system shall unlock an endless game mode when the user has completed all designed levels.
13. The system shall allow the user to pause the game and resume playing without loss of progress.
14. The system shall allow the user to save and load the current session.
15. The system shall display a tip for the user within every minute during the tutorial level.
16. The system shall save the user's data after receiving a save request from the user.
17. The system shall display user selected map upon the user request.
18. The system shall provide the player's statistics for the level upon completion or failure of a level.
19. The system shall display a timer on the right hand corner when the user enters a level to show the remaining duration of the active power-up.
20. The system shall allow the user to move in four different directions.

21. The system shall provide randomly generated levels.
22. The system shall save the player's progress after completing a level.
23. The system shall allow the player to receive power ups when the player finishes a level.
24. The system shall safely terminate when you quit.
25. The system shall provide a sandbox mode.
26. The system shall allow the user to adjust the background music.
27. The system shall allow the user to adjust the volume of in-game sound effects.
28. The system shall adjust the player's vision based on their level progress.
29. The system shall allow custom player avatars.
30. The system shall allow the user to assign a custom name to their avatar.

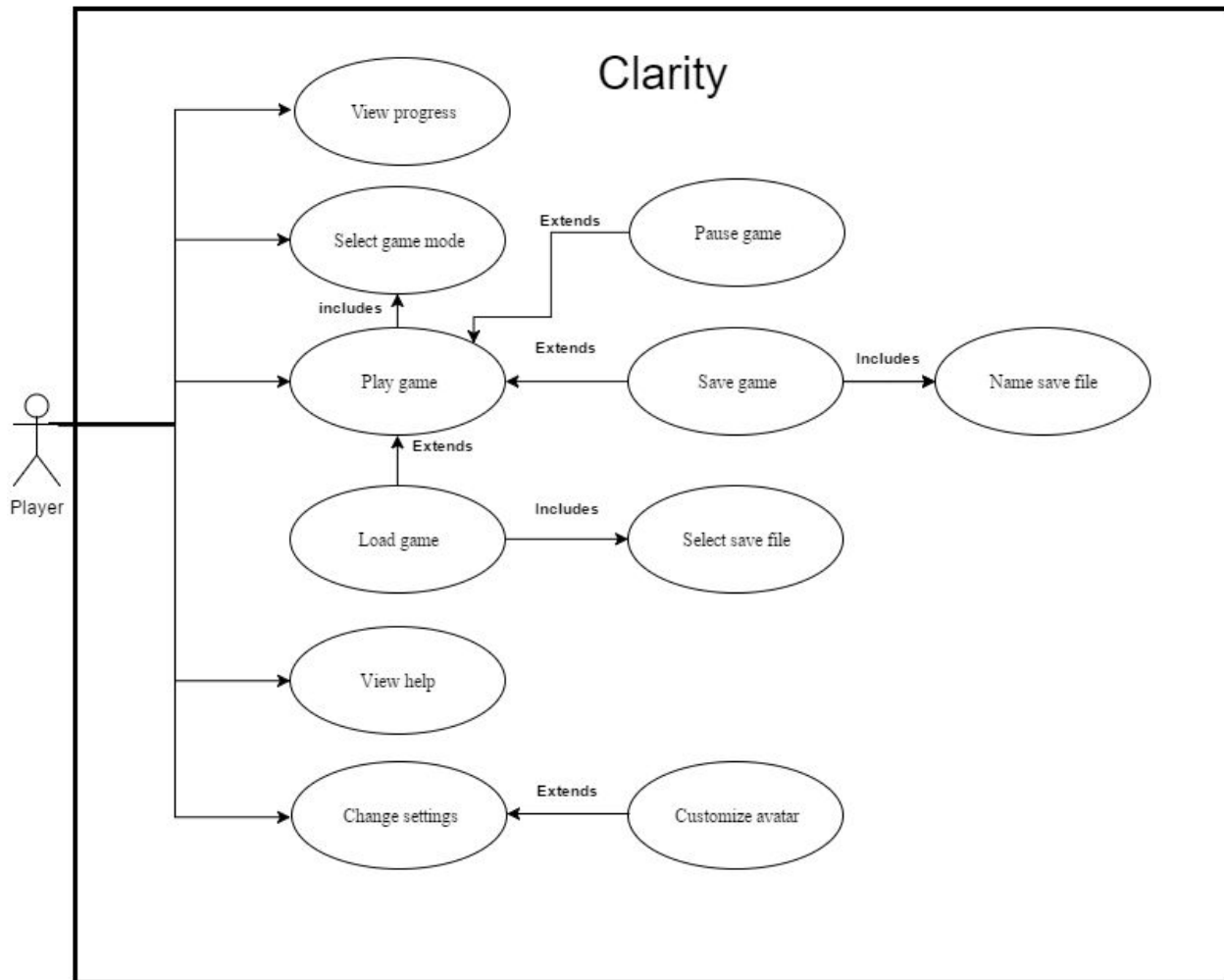
4. Non-Functional Requirements

1. The system shall render to the screen at least 60 frames per second.
2. The system shall encrypt and store user save data.
3. The system shall load MP3 audio files in less than 5 seconds.
4. The system shall output audio to the user within 100 milliseconds when an action that is supposed to produce a sound occurs.
5. The system shall give the user 10 minutes to complete the tutorial level.
6. The system shall restart the current level upon failure in less than 10 seconds.
7. The system shall record a user's total playtime to within one tenth of a second.
8. The system shall require less than one gigabyte of RAM at any time during its operation.
9. The system shall be playable through Windows XP and later using Java 8 or higher.
10. The system shall take no longer than 5 minutes for any person that is at least eight years old to reach 10 points.
11. The system shall be compatible with keyboard and mouse.
12. The system shall require a password to edit your user profile.
13. The system shall respond to a movement command within 100 milliseconds after input.
14. The system shall update the game logic 60 times per second

15. The system shall take no longer than 5 seconds to load the user's data.
16. The system shall generate random levels in less than 5 seconds.
17. The system shall load the game to the main menu in less than 15 seconds.
18. The system shall crash less than once every 1,000 executions.

5. Use Cases

5.1. Overview Diagram



5.2. Internal Steps Descriptions

Name: View Help

1. The player requests help.
2. The system opens help screen.
3. The player gets help then requests to exit.
4. The system closes help screen.

Extension:

2a. *The system fails to load help:* System notifies player and terminates the use case.

Name: Changing settings

1. The player selects the Settings tab.
2. The system displays the Settings menu that contains an option to modify the avatar, sound, music, and controls of the game.
3. The player selects one of the four settings to modify.
4. The system displays the possible options that can be modified in the selected category.
5. The player modifies the settings and requests to save the settings.
6. The system saves any changes to the system and applies the new settings.

Extensions:

- 5a. *No settings were modified:* The player cannot select to save the settings.
- 6a. *The system fails to save options:* System displays a popup error message and current settings remain the same.

Name: Load Game

1. The player requests to resume playing the game level he/she has previously saved.
2. The system requests a game text file for loading.
3. The player provides the saved game text file.
4. The system reads the saved game text file.
5. The system loads the game for the player.

6. When the system finish loading, the player starts playing the saved game level.

Extensions:

3a. *The game text file does not exit:* The system notifies the player that saved file does not exist and allow player to provide a game text file.

4a. *The game file provided is not valid:* the system notifies player that the file is not the game file and exit the use case.

Name: Customize Player Avatar

1. The player navigates to settings menu from main menu.
2. The system opens settings overlay.
3. The player navigates into avatar customization screen.
4. The system opens avatar customization screen.
5. The player selects desired hat, top, and bottom for avatar.
6. The player saves changes to avatar.
7. The system closes avatar customization screen and stores player's avatar changes.

Extensions

2a. *The settings overlay fails to appear:* Show generic error message to player and prompt them to repeat the action.

3a. *The player has a previously customized avatar:* System displays saved avatar for editing instead of new avatar.

5a. *The player makes no changes to either top, hat, bottom:* System makes no changes to currently saved avatar.

6a. *The avatar storage within system is unavailable:* Inform player that system failed to save avatar and prompt them to try again.

7a. *The player makes changes to avatar but does not save them:* System asks player if they want to save the changes they made or discard them.

Name: Select Game Mode

1. The player launches the application.
2. The system loads the assets into memory and goes to the main menu.
3. The player selects 'Play Game'.

4. The system displays the different game modes on the screen.
5. The player selects a game mode.
6. The system loads the selected game mode.

Extensions

- 2a. *The assets fail to load*: Display appropriate error message and close.
- 6a. *The game mode fails to load*: Display appropriate error message and close.

Name: Save Game

1. The player requests to save game.
2. The system checks to see if there's already a saved game of the player requested name in the database.
3. The system saves the game into the database.

Extension

- 2a. The database contains a saved game of the requested name: System asks the player to name the new save file something else.
- 3a. The database fails to save: Display error and request the player to try again.

6. Bugs

6.1. US - New ability

Original: As a user, I want to increase my player's skills with new abilities, so that I can cope with the increasingly difficult levels.

Bug: The phrase "increase my player's skills with new abilities" is worded awkwardly and is unclear.

Revised: As a user, I want to gain new abilities, so that I can cope with the increasingly difficult levels.

6.2. US - Level Difficulty

Original: As an advanced user, I want the levels to become more difficult, so that the game keeps me interested in playing it.

Bug: "Advanced user" is a bit ambiguous. "In playing it" may be a bit redundant.

Revised: As an advanced user, I want the levels to increase in difficulty, so that the game remains interesting.

6.3. US - Custom Map

Original: As a player, I want a custom game option that allows me to make my own level.

Bug: The user story does not that a purpose, or the “so that” (“As a , *I want _*, so *that _*.”). Why does the player want a custom game option to make their own level?

Revised: As a player, I want a custom game option, so that I can make my own level.

6.4. US - Soundtrack

Original: As a developer, I want to have access to a test level, so that I can verify that all the game mechanics function according to the documentation.

Bug: This is a duplicate of US - Test Level. This needs to be replaced with the correct User Story.

Revised: As a user, I want to listen to an upbeat soundtrack, so that I am more engaged with the the game.

6.5. US - Hints

Original: As a player, I want to receive a hint if I’m going in the correct direction, so that I save time.

Bug: Hints should be received when the player is going in the wrong direction, since the point of hints is to help struggling players.

Revised: As a player, I want to receive a visual cue if I’m going in the correct direction, so that I save time.

6.6. NFR - System Update Time

Original: The system shall update the game logic 60 times per second with a tolerance of one update per second.

Bug: A little confusing to me - what does “with a tolerance of” mean? Specify.

Revised: The system shall update the game logic 60 times per second

6.7. NFR - Loading

Original: The system shall load the game progress and data when user resumes the game.

Bug: I'm not sure, but this seems like more of a functional requirement. It's describing what the system should do.

Revised: The system shall load MP3 audio files in less than 5 seconds.

6.8. FR - Endless mode

Original: The system shall unlock an endless game mode when the user has completed all pre-designed levels.

Bug: The phrase "pre-designed" is a bit ambiguous.

Revised: The system shall unlock an endless game mode when the user has completed all of the designed levels.

6.9. FR - Display map

Original: The system shall display user selected map.

Bug: It seems obvious that the system will display the map when the user selects it, but it's not explicitly stated in your requirement.

Revised: The system shall display user selected map upon the user request.

6.10. FR - Display load time

Original: The system shall take no longer than 5 seconds to load the user's data.

Bug: Specify what a "selected" user is or remove "selected" if it is not necessary to the functional requirement.

Revised: Changed to a nonfunctional requirement

6.11. FR - Display current time

Original: The system shall display a timer to show the remaining duration of the active power-up.

Bug: The system shall display a timer on the right hand corner when the user enters a level to show the remaining duration of the active power-up.

Revised: The system shall display a timer on the right hand corner when the user enters a level to show the remaining duration of the active power-up.

6.12. FR - Update scoreboard

Original: The system shall update the user scoreboard when a higher score is achieved.

Bug: "higher" isn't specified as being relative to anything.

Revised: The system shall update the user scoreboard when a higher score is achieved.

6.13. FR - Game stats

Original: The system shall provide the player's statistics for the level upon completion or failure of a level.

Bug: "statistics" is not clearly defined.

Revised: "Statistics" now defined in glossary of terms (WIP).

6.14. FR - Pause feature

Original: The system should allow the user to pause the game and resume playing without loss of progress.

Bug: "Loss of progress" has not been clearly defined in the issue.

Revised: New definition for "loss of progress" added to glossary of terms

6.15. FR - Display map

Original: The system shall take no longer than 5 seconds to load the user's data.

Bug: "User selected map" is unclear here. If you mean level, say level instead.

Revised: The system shall display user selected map upon the user request.

6.16. FR - BGM Volume

Original: The system shall allow the User to adjust the background music.

Bug: It is unclear whether adjusting the background music means changing the song or the volume or both.

Revised: The system shall allow the User to adjust the background music volume.

6.17. FR - Instructions

Original: The system shall provide additional details about game mechanics through a series of written instructions.

Bug: What are the details in addition to?

Revised: The system shall provide details about game mechanics through a series of written instructions.

6.18. US - Soundtrack

Original: As a user I want to listen to an upbeat soundtrack, so that I am engaged with the game.

Bug: Upbeat is subjective.

Revised: We defined "upbeat" in the dictionary.