



# **System requirement document**

## **Revision 1**

*Team Roshambo*

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Professor: Dr. Jacques Carette

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## **1. The Purpose of the project**

### **a. Background**

*Keep Warm* is our capstone project for this final year of undergraduate study in Software Engineering (Game Design). Creativity and professional technical skills were needed in the development of project. The completion of this capstone project is a graduation requirement.

### **b. Goals of the Project**

Team members should develop their professional technical skills and creativity during the development period of the project. The goal of this project is to create a game with a great player experience and interesting gameplay. People who play the game should find this game interesting. Others who only view the game should express a desire to play this game.

## **2. The Stakeholders**

### **a. Clients**

#### **i. Dr. Jacques Carette, McMaster University**

Software Engineering (Game Design) professor for capstone course (SE4GP6). Dr. Jacques Carette examines and approves of the final grade of the project. Any requirements that he provides must be taken into consideration.

#### **ii. Dan Szymczak, McMaster University**

Software Engineering (Game Design) teaching assistant for capstone course (SE4GP6). Mr. Szymczak grades the project content and provides feedback for improvement. He reports directly to Dr. Jacques Carette.

## **b. Customers**

The basic game set is for any players (the recommended age is 10 years or older). This game is targeted towards players who enjoy playing PC games and games that require important decision-making. The game is also targeted at people who enjoy playing games with others either cooperatively or competitively.

## **c. Other Stakeholders**

- i. Academic Integrity Officer, McMaster University

Academic Integrity Officer has the duty to ensure the project is original work. Future game development will be stopped if an academic integrity officer finds that the project is academically dishonest.

## **d. Test**

People who have great video game experience and game skill will be selected to be a play tester. They will give input on how the game should be improved and discover technical “bugs” within the game. Team roshambo will get feedback from these people and fix bugs before the game is released.

## **e. Development team**

Jin Liu, Ling Yang, Wenbin Yuan and Sam Scargall are the members of development team that are responsible for all of the submitted work and validated assets.

## **f. Judges**

At end of the semester, the final demonstration of this project will occur. Customers will participate in the examining and approval for the final grades of the project.

### **3. Mandated Constraints**

#### **a. Solution Constraints**

Any requirements given by Dr. Carette must be met. The game engine must be Unity and any game genre is acceptable.

#### **b. Implementation Environment of the System**

The game must be implemented on either Windows or MacOS.

The input devices will be constrained to using a Keyboard/Mouse combination.

#### **c. Partner or Collaborative Applications**

##### **i. Unity**

Any constraints specified by the Unity Engine used for the game must be met. A computer or a laptop with technical specifications that meet the minimum system requirements for the Unity must be used to run this game.

#### **d. Off-the-Shelf Software**

##### **i. Unity**

A personal version of unity is used for this project. However, the project implemented under this version cannot be sold.

#### **e. Anticipated Workplace Environment**

The game is going to be played on a personal computer or a laptop with a windows operating system. The player will be seated at a chair in front of a table that holds the necessary devices (Monitor, input devices and audio system).

#### **f. Schedule Constraints**

There are approximately six months to develop the capstone project. It must be finished by 25th March, 2018 with no extension. This is mandatory to pass the course as stated by Dr. Carette and Mr. Szymczak.

#### **g. Budget Constraints**

N/A

### **4. Naming Conventions and Terminology**

#### **a. Unity**

Unity is a cross-platform game engine developed by Unity Technologies, it is primarily used to develop games, and it is available for both Windows and Mac operating system.

#### **b. Microsoft Windows**

Microsoft Windows is a metafamily of graphical operating systems and it supports the game running on it.

#### **c. Product Use Case (PUC)**

A product use case elaborates on a scenario, showing event name, trigger, preconditions, system requirements and outcome.

#### **d. Resources**

Foods, water etc. things are randomly placed in the game, the player can collect them and use them to keep themselves alive. Supplies are also (woods, rocks,ropes, poisonous weeds) things that the player can use them to make traps, to help them win the game.

#### **e. 2D (Two-dimensional)**

Two-dimensional is a geometric model of the planar projection of the physical universe. The two-dimensions are commonly called length and width where both directions lie in the same plane.

### **5. Relevant Facts and Assumptions**

#### **a. Relevant Facts**

- i. Free online assets with proper license will be used in this project with credit for non-commercial purpose.
- ii. Gamepads will not be supported by this project.
- iii. Almost all types of strategy games require internal decision tree style thinking and typically very high situational awareness. The time the player spend on thinking about the strategy will determine how well they will do in the game.

#### **b. Business Rules**

- i. All requirements described by Dr. Carette must be met.
- ii. A demonstration on the final version of the game must be present on April 2017(specific date has not been determined).

#### **c. Assumptions**

- i. *Keep Warm* will not be commercially released.
- ii. All the work should be original work from team members.
- iii. The game will be demonstrated on a machine with the same operating system as stated in Anticipated Workplace Environment
- iv. Some of the assets are not original(with proper license and credit).

### **6. Scope of Work**

#### **a. The Current Situation**

- i. Game Overview:
  - 1. *Keep Warm* is a multiplayer game for 2 people to play locally on a single device. Players will take turns controlling their characters and collecting resources. The goal of the game is to survive danger longer than your opponent and be the last person standing.
- ii. Inspiration

1. *Keep Warm* is an individual game. It is not intended to replace these games nor add to them.
2. *Keep Warm* is inspired by several games.
  - a. Worms series: worms is a famous turn-based multiplayer game and it inspired us to use a turn-based structure and a multiplayer competitive mode.
  - b. This war of mine: an excellent indie game that provided us the idea of survival and resource collections. It is fun to play because the resources are limited and the player needs to think about the strategy regarding distributing resources on different aspects.
  - c. Don't starve: an great example of survival game and it inspired us on the survive feature and background stories. Health, hunger and crafting are also good features that inspire us as features on our game.

## **b. The Context of the Work**

- i. This game is a final year capstone project for the professor and the teaching assistant.
- ii. The gameplay and player experience of the game will be demonstrated and graded.
- iii. Team members are expected to develop their professional technical skills and creativity during the development of the project.

## **c. Work Partitioning**

N/A



#### d. Specifying a Business Use Case

N/A

### 7. Scope of the Product

#### a. Product Boundary

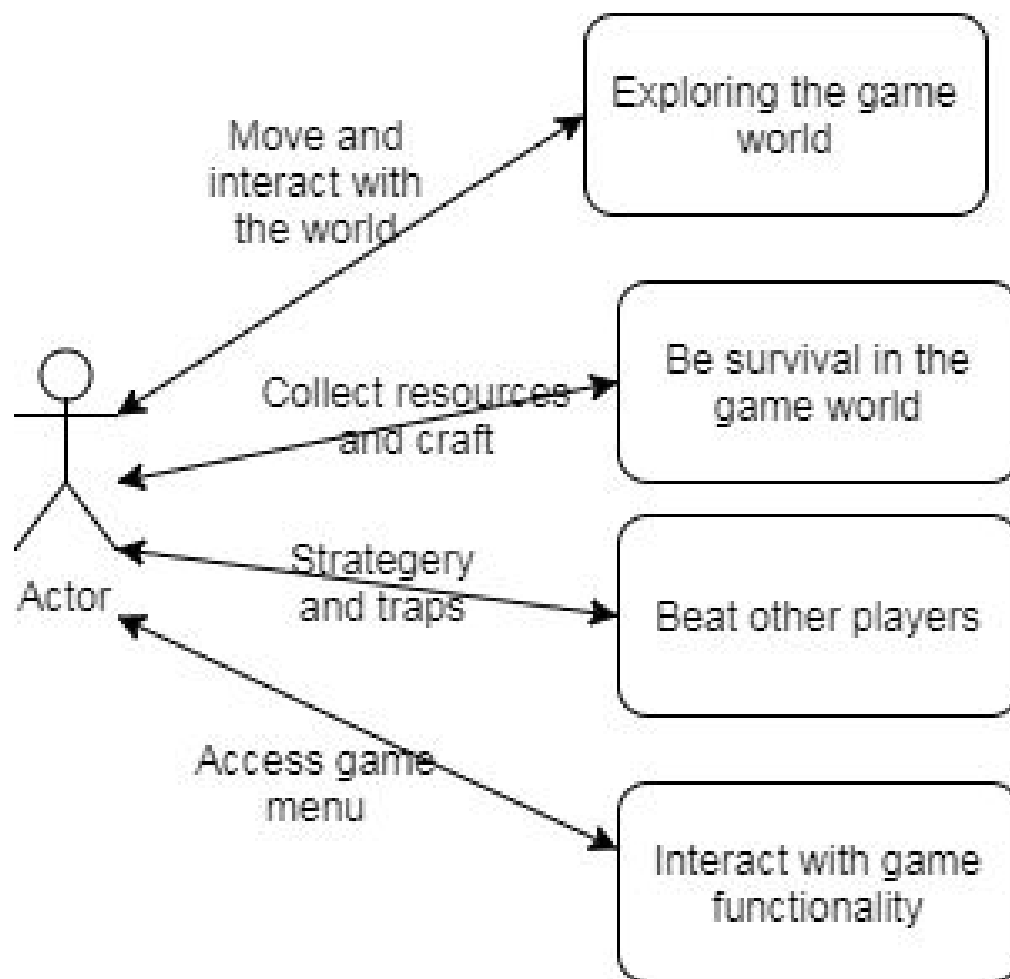


Figure 1 -- Product Boundary

## b. Use Case Table

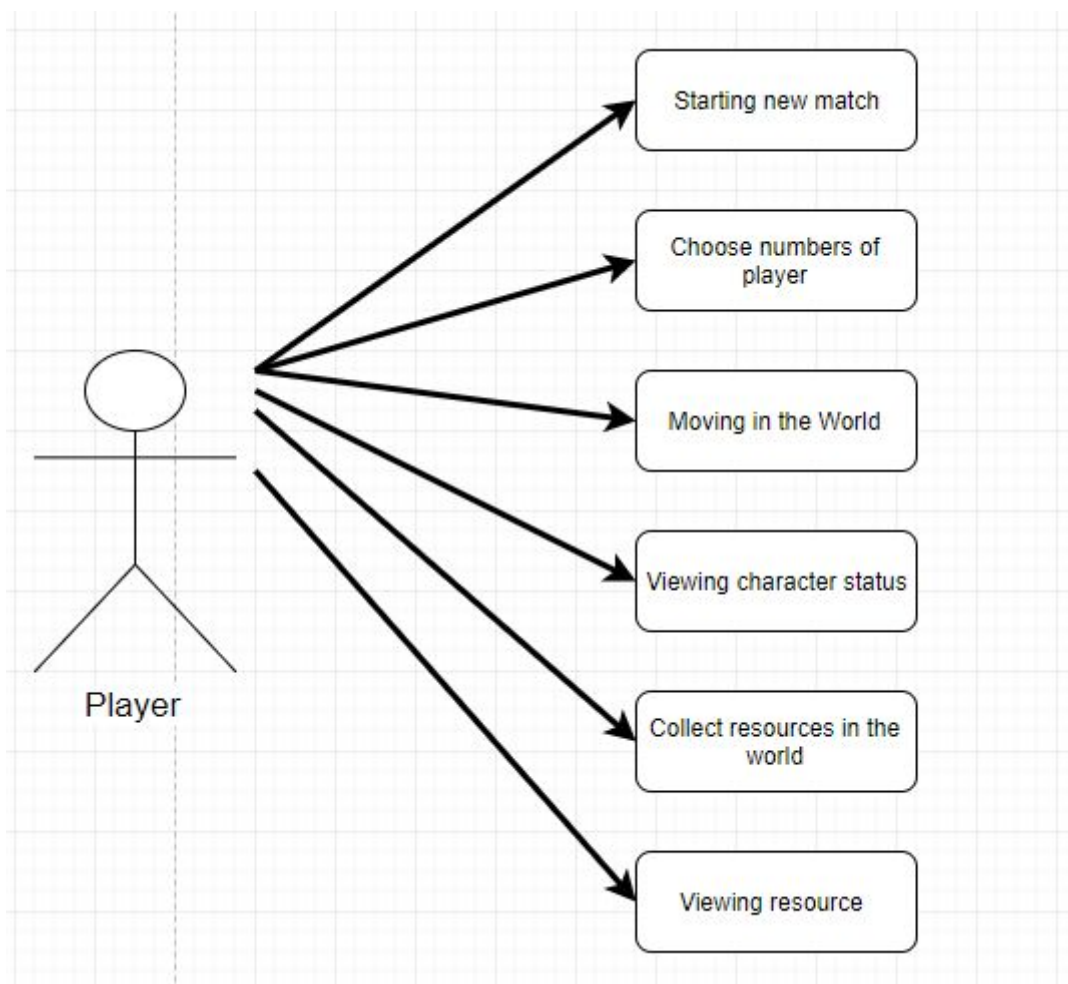


Figure 2 -- Use case part 1

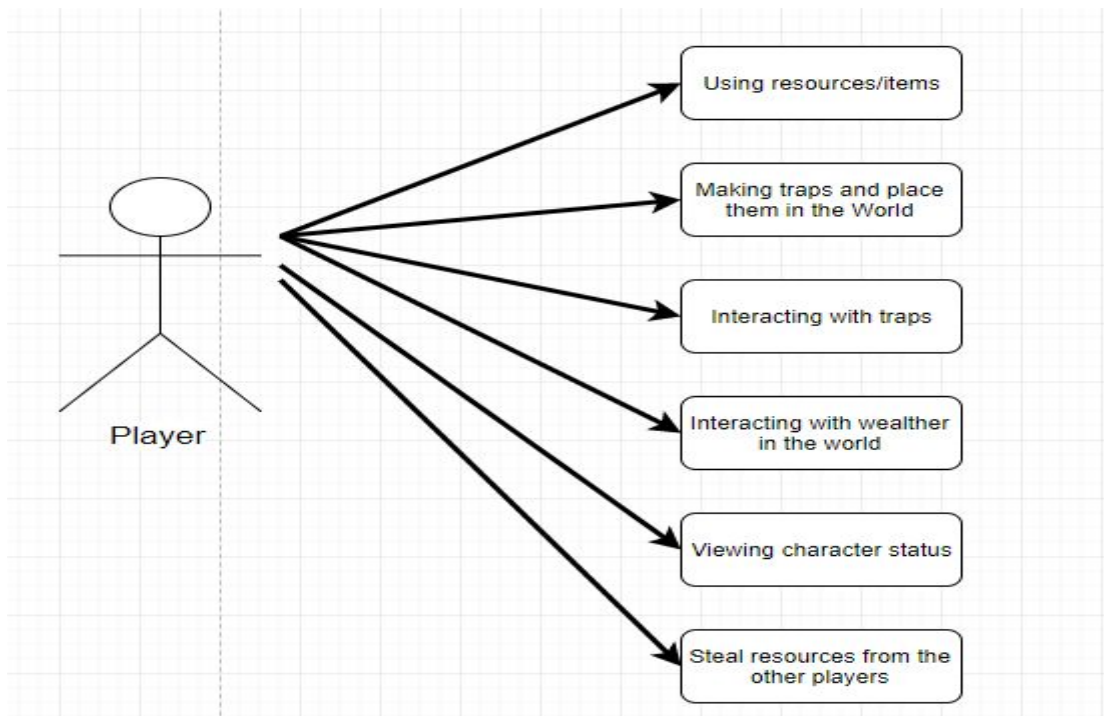


Figure 3 -- Use case part 2

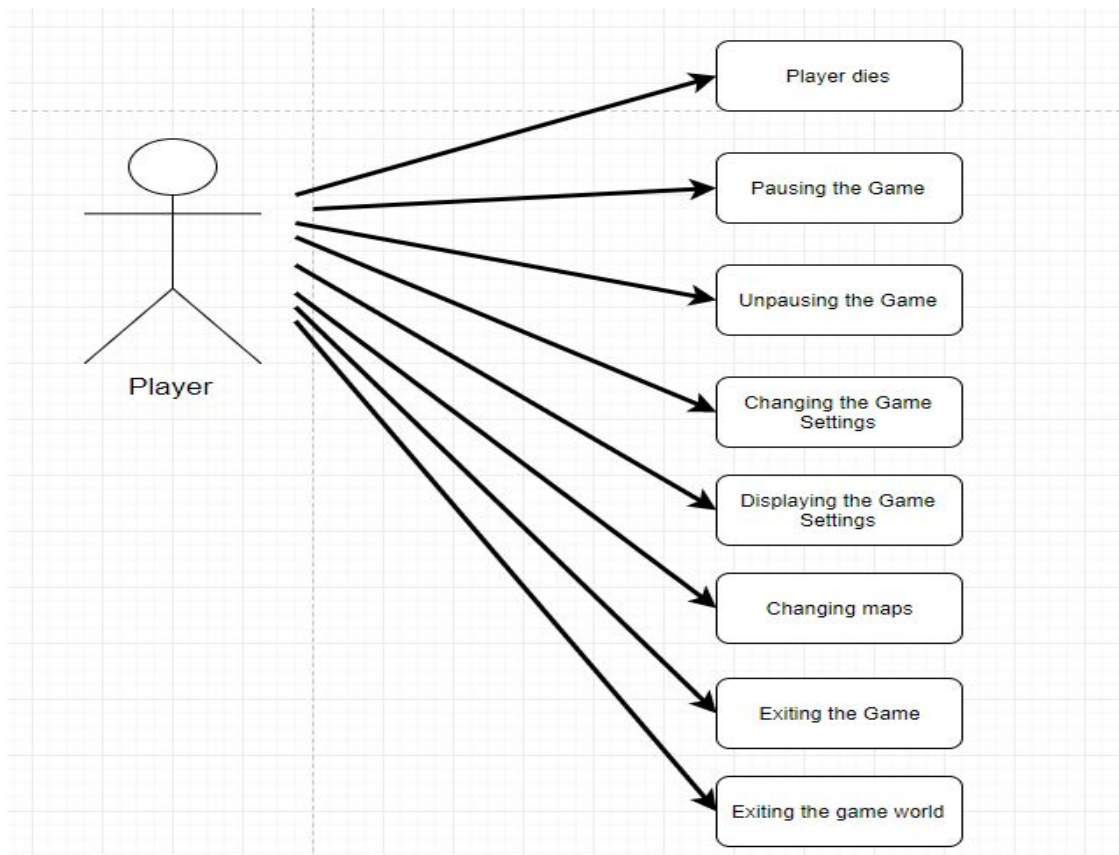


Figure 4 -- Use case part 3

<b>PUC. No.</b>	<b>PUC Name</b>	<b>Actors</b>	<b>Input/Output</b>
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<b>1</b>	Starting the new game	Player	Key input(IN), initial game condition(OUT)
<b>2</b>	Choosing the number of players	Player	Key input(IN), Different type of players(OUT)
<b>3</b>	Moving in the world	Player	Key input (IN), Character action(OUT)
<b>4</b>	Viewing character status	Player	Key input(IN), Player information(OUT)
<b>5</b>	Collecting resources	Player	Key input(IN), Resources action(OUT)
<b>6</b>	Viewing resources	Player	Key input(IN), Resources information
<b>7</b>	Classify resources	System	Classify resources put them in different categories category(OUT)
<b>8</b>	Using resources	Player	Key input(IN) category(IN) Success boolean(OUT) player status(OUT) resources action(OUT)
<b>9</b>	Making/placing traps	Player	Key input(IN), category(IN) choose resources command(IN),success boolean(OUT), traps action(OUT)
<b>10</b>	Classify traps	System	Classify traps depend on what are they made

			from trap category(OUT)
<b>11</b>	Interacting with traps	Player	Trap category(IN) Player action (OUT) Player status(OUT)
<b>12</b>	Weather	System	Weather is is the countdown of the game, Player should end game before the certain time.
<b>13</b>	Interacting with weather	Player	Player status( OUT)
<b>14</b>	Player dies	Player	death message(OUT)
<b>15</b>	Defeating an enemy with traps	Player	Success message(OUT)
<b>16</b>	Pausing the game	Player	Key input(IN), pause message(OUT)
<b>17</b>	Unpausing the game	Player	Key input(IN)
<b>18</b>	Chaning the game settings	Player	Key input(IN), success boolean(OUT), game settings (OUT)
<b>19</b>	Displaying the game settings	Player	Key input(IN), Game settings(OUT)
<b>20</b>	Changing game world	Player	Key input(IN), game world conditions(OUT)
<b>21</b>	Exiting the game	Player	Key input(IN)
<b>22</b>	Exiting the in-game world	Player	Key input (IN)
<b>23</b>	Winning the game	Player	Winning message(OUT)
<b>24</b>	Displaying the Minimap	Player	Key input (IN) Map visual (OUT)

<b>25</b>	Exiting the menu	Player	Key input (IN) Menu visual (OUT)
<b>26</b>	Toggling the Sound	Player	Key input (IN) Audio change (OUT)
<b>27</b>	Changing the round	System	Game Condition(IN) Game Condition(OUT)
<b>28</b>	Display the game help manual	Player	Key input (IN) Help information (OUT)

### c. Individual Product Use Cases

<b>PUC No.1</b>	Starting the new game
<b>Trigger</b>	The player chooses the “new game” option from main menu.
<b>Preconditions</b>	The Player is not currently in an active game session.
<b>Procedure</b>	Loading the game.
<b>Outcome</b>	The player has control of the character in a new game.

<b>PUC No.2</b>	Choosing the number of players
<b>Trigger</b>	The main player selects how many players in pop-up menu.
<b>Preconditions</b>	The main Player has started a new game. The player is not the game session
<b>Procedure</b>	Menu shows “choose the number of players”.

<b>Outcome</b>	The numbers of players have control of their character in a new game.
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<b>PUC No.3</b>	Moving the character
<b>Trigger</b>	The player clicks/presses the moving buttons.
<b>Preconditions</b>	The player is in control of the character. The player is in their turn.
<b>Procedure</b>	Get the direction and moving the character.
<b>Outcome</b>	The character moves from the original point at the direction given by player.

<b>PUC No.4</b>	Viewing character status
<b>Trigger</b>	The game displays the character's healthy/energy bar.
<b>Preconditions</b>	The game is started. The player is in control of their character.
<b>Procedure</b>	Display health and energy of player.
<b>Outcome</b>	The status of the player is displayed.

<b>PUC No.5</b>	Collecting resources
<b>Trigger</b>	The player collects resources in the game world.
<b>Preconditions</b>	The player is in control of their character. The player is in their turn. The player is very close to the target. The player is alive. The player is not trapped and able to take action.
<b>Procedure</b>	Close to the resources. Collect the resources.

	Update the resources to characters' bag.
<b>Outcome</b>	The resources disappear from the game world.

<b>PUC No.6</b>	Viewing inventory
<b>Trigger</b>	The player opens their bag.
<b>Preconditions</b>	The player is in control of their character. The player is alive. The player is able to take action
<b>Procedure</b>	Determine what item the player wants to look at Display the information of that item when game pointer is on that item.
<b>Outcome</b>	The player can see the information of items in their bag.

<b>PUC No.7</b>	Crafting items
<b>Trigger</b>	The player crafts items.
<b>Preconditions</b>	The player is in control of their character and the player has proper resources to craft particular item, The player is in their turn. The player is not trapped or in any condition that cannot move.
<b>Procedure</b>	The player determine what item they want to craft Craft that item by clicking craft button. The item will appear in the player's inventory.
<b>Outcome</b>	The player crafts the item.

<b>PUC No.9</b>	Placing traps
<b>Trigger</b>	The player select trap in inventory and choose to place on map



<b>Preconditions</b>	The player is in control of their character. The player is in their turn. The player is not in trap and able to take action The player has an available item in inventory
<b>Procedure</b>	Determine what resources the player wants to use to make traps. Update the traps to the player's bag. Place the traps in the game world. Determine if the traps placed successful.
<b>Outcome</b>	The traps are placed in the game world.

<b>PUC No.11</b>	Interacting with traps
<b>Trigger</b>	The player moves onto the traps.
<b>Preconditions</b>	The player is in control of their character. The player is in their turn. The player is not trapped in other traps
<b>Procedure</b>	Determine if the player step on the traps. The traps damage to the player. Update the player status.
<b>Outcome</b>	The player's healthy/energy bar goes down, the player's status is changed because of the traps.

<b>PUC No.13</b>	Interacting with weather
<b>Trigger</b>	Time runs out.
<b>Preconditions</b>	The player is in control of their character, the player is still alive.
<b>Procedure</b>	As time runs down, weather condition will get worse and worse for the player to stay alive.
<b>Outcome</b>	The player's healthy/energy bar goes down as the weather condition getting worse, environment of the world will change.

<b>PUC No.14</b>	Player dies
<b>Trigger</b>	The player's health/ energy bar goes to zero.
<b>Preconditions</b>	The player is in control of their character. The other player is still alive.
<b>Procedure</b>	Determine what the player loses.
<b>Outcome</b>	Display a message that says "you lose".

<b>PUC No.15</b>	Defeating an enemy with traps
<b>Trigger</b>	The enemy's health or energy goes to zero because the traps.
<b>Preconditions</b>	The player is in control of their character, the traps have to be made by the player not someone else.
<b>Procedure</b>	Determine if the enemy drop any resources. Determine if the game ends.
<b>Outcome</b>	Display a message that says "You has slain an enemy".

<b>PUC No.16</b>	Pausing the game
<b>Trigger</b>	The player clicks the pause button.
<b>Preconditions</b>	The player is in control of their character. The player can not be in pause mode.
<b>Procedure</b>	Freeze real-time play. Enable the unpause button.
<b>Outcome</b>	The game is paused.

<b>PUC No.17</b>	Resume the game
<b>Trigger</b>	The player clicks the Resume button.

<b>Preconditions</b>	The player is in control of their character, the player must be in pause mode.
<b>Procedure</b>	Resume real-time play. Disable the resume button.
<b>Outcome</b>	The game resumes play.

<b>PUC No.18</b>	Displaying the game settings
<b>Trigger</b>	The player selects the menu to display the game setting.
<b>Preconditions</b>	Menu is available.
<b>Procedure</b>	Determine and display the current game setting.
<b>Outcome</b>	The game settings are display.

<b>PUC No.19</b>	Changing the game settings
<b>Trigger</b>	The player selects the menu to display the game setting and changes the setting.
<b>Preconditions</b>	The player is viewing the Game Setting menu.
<b>Procedure</b>	Determine the new settings. Change the settings. Display the new settings.
<b>Outcome</b>	The new game settings are display.

<b>PUC No.20</b>	Changing the game world
<b>Trigger</b>	The player selects the option menu and menu shows all the game world.

<b>Preconditions</b>	The player is not currently in the game and option menu is available.
<b>Procedure</b>	Determine what the game world the player is going to play. Display the new game world.
<b>Outcome</b>	The new game world is displayed.

<b>PUC No.21</b>	Exit to the desktop
<b>Trigger</b>	The player clicks the exit button from the title screen.
<b>Preconditions</b>	The player is in the title screen.
<b>Procedure</b>	The game process will end and the player will return to desktop screen.
<b>Outcome</b>	The player quited the game.

<b>PUC No.22</b>	Exititng the In-Game World
<b>Trigger</b>	The player selects the "quit game" option from the pause menu.
<b>Preconditions</b>	The player is in control of the character. The pause menu is open.
<b>Procedure</b>	Warn the player they are going to leave the game Return to the main screen.
<b>Outcome</b>	The player is returned to the main screen.

<b>PUC No.23</b>	Winning the game
<b>Trigger</b>	There is only one player stay alive in the map.
<b>Preconditions</b>	The player is in control of their character.

<b>Procedure</b>	Calculate how long the player has been alived. Calculate how many enemies the player has been slained.
<b>Outcome</b>	Display a message that says “You are the king of survival”

<b>PUC No.24</b>	Displaying the mini map
<b>Trigger</b>	The game is in progress.
<b>Preconditions</b>	Game world has been generated.
<b>Procedure</b>	Calculate player’s current location. Update their location onto the mini map.
<b>Outcome</b>	Display player’s location on mini map.

<b>PUC No.25</b>	Exiting menu
<b>Trigger</b>	The menu is open
<b>Preconditions</b>	The player is in the menu page.
<b>Procedure</b>	Provide a button for player to close the menu. Close the menu when player click that button..
<b>Outcome</b>	Menu is closed.

<b>PUC No.26</b>	Toggling the sound
<b>Trigger</b>	The game is in progress.
<b>Preconditions</b>	It is not in the loading page.
<b>Procedure</b>	Provide a button for player to toggle the sound. Player clicks the button.

<b>Outcome</b>	Sound is toggled.
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<b>PUC No.27</b>	Changing the round
<b>Trigger</b>	The time limit of one player's turn is reached
<b>Preconditions</b>	The players are in game. The players are not in paused menu.
<b>Procedure</b>	Shift the camera to focus on another player, UI change to the other player's.
<b>Outcome</b>	Control of player has changed.

<b>PUC No.28</b>	Display the game manual
<b>Trigger</b>	The help button was clicked on the start menu
<b>Preconditions</b>	The players are not in game. The players are in the start menu.
<b>Procedure</b>	The menu screen opens a new image explaining with text and images the rules of the game.
<b>Outcome</b>	The player has seen the rules of the game.

## 8. Functional requirements

### a. Core Mechanics

#### i. Primary Gameplay Mode

<b>Requirement: 1</b>	<b>Requirement Type:</b> Functional
<b>Priority:</b> Very High	<b>PUC:</b> 3
<b>Description:</b>	The player must be able to move the character using the controller. Press "A" for moving left, "D" for moving right, "W" for moving up on a ladder and "D" for moving down on

	a ladder, "Space" for jump
<b>Rationale:</b>	The player should be able to move the character to explore the game world.
<b>Fit Criterion:</b>	The character will move in response to the player's control input.
<b>Originator:</b>	Jin Liu

<b>Requirement: 2</b>	<b>Requirement Type:</b> Functional
<b>Priority:</b> Very High	<b>PUC:</b> 27
<b>Description:</b>	The game must automatically change the turn after each player's energy is empty.
<b>Rationale:</b>	The player should play the game in turns.
<b>Fit Criterion:</b>	The game should change player as the time limit of each turn has reached
<b>Originator:</b>	Wenbin

<b>Requirement: 3</b>	<b>Requirement Type:</b> Functional
<b>Priority:</b> Very High	<b>PUC:</b> 4
<b>Description:</b>	The player must be able to view their own character's current status(hunger, temperature, etc.)
<b>Rationale:</b>	The player need to check their current status to plan what they need to do later.
<b>Fit Criterion:</b>	The player will be able to see their current status by numbers( example: hunger(50/100), temperature(30°) ) directly on the UI system.
<b>Originator:</b>	Jin Liu

<b>Requirement: 4</b>	<b>Requirement Type:</b> Functional
<b>Priority:</b> Very High	<b>PUC:</b> 5
<b>Description:</b>	The player must be able to collect resources.
<b>Rationale:</b>	The player need to collect resources such as logs and foods to survive.

<b>Fit Criterion:</b>	The player will be able to collect the resource when the character is closed to the resource.
<b>Originator:</b>	Jin Liu

<b>Requirement: 5</b>	<b>Requirement Type:</b> Functional
<b>Priority:</b> High	<b>PUC:</b> 6
<b>Description:</b>	The player must be able to view the introduction of items in their inventory.
<b>Rationale:</b>	The player need to know the usage of items in their inventory.
<b>Fit Criterion:</b>	The player will be able to view the introduction of the item by putting the game pointer on that specific item.
<b>Originator:</b>	Jin Liu

<b>Requirement: 6</b>	<b>Requirement Type:</b> Functional
<b>Priority:</b> High	<b>PUC:</b> 7
<b>Description:</b>	The player must be able to craft items that show on the craftable lists.
<b>Rationale:</b>	The player need to craft different items to survive.
<b>Fit Criterion:</b>	The player will be able to craft item on the craftable list by clicking craft button besides that particular item. If the player does not have enough resource, the craft button will be disabled.
<b>Originator:</b>	Jin Liu

<b>Requirement: 7</b>	<b>Requirement Type:</b> Functional
<b>Priority:</b> Medium	<b>PUC:</b> 9
<b>Description:</b>	The player must be able to place traps.
<b>Rationale:</b>	The player can use traps to harm other players which help themselves win the game.
<b>Fit Criterion:</b>	The player will be able to place traps in their inventory at the position of the character.



<b>Originator:</b>	Jin Liu
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<b>Requirement: 8</b>	<b>Requirement Type:</b> Functional
<b>Priority:</b> High	<b>PUC:</b> 27
<b>Description:</b>	The player must be able to view that his/hers turn is over and see that the next player's turn is coming
<b>Rationale:</b>	The players can not know whose turn is it is to play by looking at the game alone.
<b>Fit Criterion:</b>	The player can identify on the screen whose turn it is to play.
<b>Originator:</b>	Samuel Scargall

<b>Requirement: 9</b>	<b>Requirement Type:</b> Functional
<b>Priority:</b> Medium	<b>PUC:</b> 3
<b>Description:</b>	The player must be able to end their turn immediately if they want.
<b>Rationale:</b>	The player want to end their turn immediately.
<b>Fit Criterion:</b>	The player can chooes when their turn ends.
<b>Originator:</b>	Samuel Scargall

<b>Requirement: 10</b>	<b>Requirement Type:</b> Functional
<b>Priority:</b> High	<b>PUC:</b> 14
<b>Description:</b>	The player must be able to lose.
<b>Rationale:</b>	The player understands they have failed and are able to try again.
<b>Fit Criterion:</b>	The player knows when they have lost and thereby eliminated from the game.
<b>Originator:</b>	Samuel Scargall

<b>Requirement:</b> 11	<b>Requirement Type:</b> Functional
<b>Priority:</b> High	<b>PUC:</b> 23
<b>Description:</b>	The player can win the game.
<b>Rationale:</b>	The player wants a goal to acheive.
<b>Fit Criterion:</b>	The player, after passing all challenges, is notified.
<b>Originator:</b>	Samuel Scargall

<b>Requirement:</b> 12	<b>Requirement Type:</b> Functional
<b>Priority:</b> Medium	<b>PUC:</b> 24
<b>Description:</b>	The system must be able to display player's current location on the mini map.
<b>Rationale:</b>	The minimap provides the players their current location on the minimap
<b>Fit Criterion:</b>	System will calculate and display the updated mini map after every turn.
<b>Originator:</b>	Samuel Scargall

<b>Requirement:</b> 13	<b>Requirement Type:</b> Functional
<b>Priority:</b> Medium	<b>PUC:</b> 6
<b>Description:</b>	The system must be able to display resources in the game world.
<b>Rationale:</b>	The player need to gather various resources to survive in the game world.
<b>Fit Criterion:</b>	System will random generate resources and display them on the game world.
<b>Originator:</b>	Jin Liu

<b>Requirement:</b> 14	<b>Requirement Type:</b> Functional
<b>Priority:</b> Medium	<b>PUC:</b> 7
<b>Description:</b>	The system must be able to calculate the effect of items in the game world.
<b>Rationale:</b>	The system should able to calculate and apply the effect of various items when player uses them.
<b>Fit Criterion:</b>	The system will calculate and apply the effect of item on the target when player uses an item.
<b>Originator:</b>	Jin Liu

<b>Requirement:</b> 15	<b>Requirement Type:</b> Functional
<b>Priority:</b> High	<b>PUC:</b> 14
<b>Description:</b>	The system must be able to determine if the player dies.
<b>Rationale:</b>	The system should able to calculate and display proper message when the player is in the death condition.
<b>Fit Criterion:</b>	The system will calculate and display proper message when the player dies.
<b>Originator:</b>	Samuel Scargall

<b>Requirement:</b> 16	<b>Requirement Type:</b> Functional
<b>Priority:</b> High	<b>PUC:</b> 11
<b>Description:</b>	The system must be able to determine if a trap is triggered.
<b>Rationale:</b>	The system should able to monitor and update player's status when a trap is triggered.
<b>Fit Criterion:</b>	The system will update player's status when a trap is triggered.
<b>Originator:</b>	Jin Liu

<b>Requirement:</b> 17	<b>Requirement Type:</b> Functional
<b>Priority:</b> High	<b>PUC:</b> 1
<b>Description:</b>	The system must be able to generate the players at the beginning.
<b>Rationale:</b>	The players start their game in the spawn position.
<b>Fit Criterion:</b>	The system will randomly generate the spawn location of each player and apply them correctly.
<b>Originator:</b>	Jin Liu

<b>Requirement:</b> 18	<b>Requirement Type:</b> Functional
<b>Priority:</b> Medium	<b>PUC:</b> 27
<b>Description:</b>	The other players are able to take action after the previous players' turn
<b>Rationale:</b>	The player need take action in his own turn
<b>Fit Criterion:</b>	Countdown will appear at the top of the screen when player takes action in his turn
<b>Originator:</b>	Samuel Scargall

<b>Requirement:</b> 19	<b>Requirement Type:</b> Functional
<b>Priority:</b> High	<b>PUC:</b> 3
<b>Description:</b>	All the players must have same control
<b>Rationale:</b>	All the players can do actions in the game world
<b>Fit Criterion:</b>	All the characters will response to the input
<b>Originator:</b>	Jin Liu

<b>Requirement:</b> 20	<b>Requirement Type:</b> Functional
<b>Priority:</b> High	<b>PUC:</b> 2

<b>Description:</b>	The game must have at least two players to start the game
<b>Rationale:</b>	At least two players to start the game since there will be no AI / network components
<b>Fit Criterion:</b>	The game starts
<b>Originator:</b>	Jin Liu

## ii. Alternate Game Modes

There is no alternate modes in our project.

## b. Menus and other Systems

Updates from Rev0:

<b>Requirement:</b> 21	<b>Requirement Type:</b> Functional
<b>Priority:</b> Very High	<b>PUC:</b> 1
<b>Description:</b>	The player must be able to click the start button on the game title screen to start the game.
<b>Rationale:</b>	If the player cannot interact with the game menu, they will not be able to play the game.
<b>Fit Criterion:</b>	If the player selects the start button, the game will start.
<b>Originator:</b>	Jin Liu

<b>Requirement:</b> 22	<b>Requirement Type:</b> Functional
<b>Priority:</b> Very High	<b>PUC:</b> 22
<b>Description:</b>	The player must be able to click the quit button on the menu to return to the game title screen.
<b>Rationale:</b>	If the player cannot interact with the game menu, they will not be able to quit the game.
<b>Fit Criterion:</b>	If the player selects the quit button, the game will end and back to the start menu.
<b>Originator:</b>	Jin Liu

<b>Requirement:</b> 23	<b>Requirement Type:</b> Functional
<b>Priority:</b> Medium	<b>PUC:</b> 16
<b>Description:</b>	The player must be able to pause the game by clicking the pause button.
<b>Rationale:</b>	The player should be able to pause the game if they want to take a break.
<b>Fit Criterion:</b>	If the player selects the pause button, the game will be freezed.
<b>Originator:</b>	Jin Liu

<b>Requirement:</b> 24	<b>Requirement Type:</b> Functional
<b>Priority:</b> Medium	<b>PUC:</b> 17
<b>Description:</b>	The player must be able to unpause the game by clicking the unpause button.
<b>Rationale:</b>	The player should be able to continue the game if the game is paused.
<b>Fit Criterion:</b>	If the player selects the unpause button, the game will continue.
<b>Originator:</b>	Jin Liu

<b>Requirement:</b> 25	<b>Requirement Type:</b> Functional
<b>Priority:</b> Medium	<b>PUC:</b> 21
<b>Description:</b>	The player must be able to exit the game to the desktop from the title screen.
<b>Rationale:</b>	The player need to close the game if they don't want to play anymore.
<b>Fit Criterion:</b>	The player will be able to exit the game by clicking the exit menu on the title screen.
<b>Originator:</b>	Jin Liu

<b>Requirement:</b> 26	<b>Requirement Type:</b> Functional
<b>Priority:</b> High	<b>PUC:</b> 2
<b>Description:</b>	The player must be able to choose the number of players in the game.
<b>Rationale:</b>	The player wants to play the game with a certain number of people only.
<b>Fit Criterion:</b>	The player can select the number of people playing before the game starts.
<b>Originator:</b>	Samuel Scargall

<b>Requirement:</b> 27	<b>Requirement Type:</b> Functional
<b>Priority:</b> Medium	<b>PUC:</b> 19
<b>Description:</b>	The player can view the controls.
<b>Rationale:</b>	The player does not know how to operate the game.
<b>Fit Criterion:</b>	The player is offered controller instructions.
<b>Originator:</b>	Samuel Scargall

<b>Requirement:</b> 28	<b>Requirement Type:</b> Functional
<b>Priority:</b> Low	<b>PUC:</b> 18
<b>Description:</b>	The player can toggle the sound
<b>Rationale:</b>	The player does not want to hear sound
<b>Fit Criterion:</b>	The player can interact with a sound setting.
<b>Originator:</b>	Samuel Scargall

<b>Requirement:</b> 29	<b>Requirement Type:</b> Functional
<b>Priority:</b> High	<b>PUC:</b> 25

<b>Description:</b>	The player must be able to exit the menu.
<b>Rationale:</b>	The players need to exit the menu to continue the game.
<b>Fit Criterion:</b>	Player should return to game after select 'resume" in menu
<b>Originator:</b>	Jin Liu

<b>Requirement:</b> 30	<b>Requirement Type:</b> Functional
<b>Priority:</b> Low	<b>PUC:</b> 21
<b>Description:</b>	The system must confirm that the player want to exit the game.
<b>Rationale:</b>	It is important to confirm that exit is player's desired action.
<b>Fit Criterion:</b>	A confirmation message will appear when player try to exit the game.
<b>Originator:</b>	Jin Liu

## 9. Look and feel requirements

### 9.1 Appearance Requirements

<b>Requirement:</b> 31	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> Very High	<b>PUC:</b> N/A
<b>Description:</b>	The game should follow industry standard for turn base Strategy games.
<b>Rationale:</b>	The player must feel easy to play and access the game
<b>Fit Criterion:</b>	The game will include a title screen, menu for different maps and menu for options.
<b>Originator:</b>	Wenbin Yuan



<b>Requirement:</b> 32	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> High	PUC:N/A
<b>Description:</b>	The game apperance should be a 2d pixel style.
<b>Rationale:</b>	In order to generate a dark but acceptable scene the game must use a 2d pixel appearance
<b>Fit Criterion:</b>	The game must be 2d pixel and not be realistic when the players start the game.
<b>Originator:</b>	Wenbin Yuan

## 9.2 Style Requirements

<b>Requirement:</b> 33	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> High	PUC:N/A
<b>Description:</b>	The game should have a Black comedy feel
<b>Rationale:</b>	The game is about players struggle to survive but the player should also be able to enjoy the game instead of just thinking about how to live
<b>Fit Criterion:</b>	The game scene must be dark but interesting, it must let the user realize this is a game, not real life
<b>Originator:</b>	Wenbin Yuan

<b>Requirement:</b> 34	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> Very High	PUC:1-11
<b>Description:</b>	The UI should be easy to use and intuitive
<b>Rationale:</b>	The player should be able to play the game without training to the interface
<b>Fit Criterion:</b>	The game must display distinct and meaningful label and icon to nevigat the player
<b>Originator:</b>	Wenbin Yuan

## 9.3 Audio Requirements

<b>Requirement:</b> 35	<b>Requirement Type:</b> Non-functional
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<b>Priority:</b> High	PUC: 26
<b>Description:</b>	The game should have background music
<b>Rationale:</b>	The player will be more immersed in the game if there is music to hear which emphasizes theme and the tone of the game.
<b>Fit Criterion:</b>	The game must be engaging especially in situations where they are waiting for their turn to play.
<b>Originator:</b>	Samuel Scargall

<b>Requirement:</b> 36	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> High	PUC: N/A
<b>Description:</b>	The game objects should have sound effects attached to them. For example: player movement, item collection, danger, winning, losing etc.
<b>Rationale:</b>	The player should be given as much feedback as possible when playing the game for clarity purposes. Sound effects help motivate and inform the player when they perform actions.
<b>Fit Criterion:</b>	The game must give clear feedback to the player.
<b>Originator:</b>	Samuel Scargall

## 10. Usability and Humanity Requirements

### 10.1 Ease of Use Requirements

<b>Requirement:</b> 37	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> High	PUC:28
<b>Description:</b>	The game should have a manual for explaining how the game works. The player must have an option to choose whether they want view this manual or not.
<b>Rationale:</b>	The manual of the game should be straight forward. The players will know basic game rules, controls and strategy after reading it.
<b>Fit Criterion:</b>	The manual of the game will be appear on the main screen and will open up once the player clicks it.
<b>Originator:</b>	Wenbin Yuan

<b>Requirement:</b> 38	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> High	PUC:1-11
<b>Description:</b>	The player must be able to play the game comfortably in a few turns after getting into game
<b>Rationale:</b>	The game should have controls that are easy to learn.
<b>Fit Criterion:</b>	The first time users should be able to become familiar with the control of the game within 2 turns. A player should not gain a significant advantage on the other player before 2 rounds if the other is not able to control the game.
<b>Originator:</b>	Wenbin Yuan

## 10.2 Personalization Requirements

<b>Requirement:</b> 39	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> High	PUC:18, 19, 26
<b>Description:</b>	Player must be able to change the graphic/audio and control settings
<b>Rationale:</b>	The player should be able to change the setting of the game if they wish to do so
<b>Fit Criterion:</b>	When the game option menu is open, the player must be able to make change to the setting values
<b>Originator:</b>	Wenbin Yuan

<b>Requirement:</b> 40	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> Medium	PUC:19
<b>Description:</b>	Player must be able to choose between a keyboard or a mouse as an input device(or both)
<b>Rationale:</b>	Players may have different preference on controlling device
<b>Fit Criterion:</b>	The game should be able to fully control in one keyboard or one mouse
<b>Originator:</b>	Wenbin Yuan

### 10.3 Learning Requirements

<b>Requirement:</b> 41	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> High	PUC:N/A
<b>Description:</b>	The game should be attractive to gamers of all skill levels
<b>Rationale:</b>	In order to satisfy the most customers, the game should be fun enough for all players
<b>Fit Criterion:</b>	All players should be able to play the game in a very short time after they start the game
<b>Originator:</b>	Wenbin Yuan

### 10.4 Understandability and Politeness Requirements

<b>Requirement:</b> 42	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> Medium	PUC:N/A
<b>Description:</b>	The game will use English as the main language
<b>Rationale:</b>	The user should be able to understand everything in the game with only an understanding of English since our target market is in Ontario.
<b>Fit Criterion:</b>	Player should be able to read and understand the game without training
<b>Originator:</b>	Wenbin Yuan

### 10.5 Accessibility Requirements

This game does not have accessibility requirements.

## 11. Performance Requirements

### 11.1 Speed and Latency Requirements

<b>Requirement:</b> 43	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> Very High	PUC:N/A
<b>Description:</b>	The game should be able to run in at least 30 fps
<b>Rationale:</b>	30 frame per second is a basic requirement for a video

	game
<b>Fit Criterion:</b>	The game must run in at least 30 fps
<b>Originator:</b>	Wenbin Yuan

<b>Requirement:44</b>	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> High	PUC:3-11
<b>Description:</b>	The game must calculate player input in realtime
<b>Rationale:</b>	The game is time limited and turn based. If the game cannot process player input in real time, it will decrease the playability in a very large scale.
<b>Fit Criterion:</b>	The player should not feel a significant delay between input and visual feedback from the game
<b>Originator:</b>	Wenbin Yuan

<b>Requirement: 45</b>	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> High	PUC:6-11
<b>Description:</b>	The items player obtain or use should be displayed properly as players interact with them in real time.
<b>Rationale:</b>	The game is time limited and turn based. If the game cannot process items in real time, it will decrease the playability in a very large scale.
<b>Fit Criterion:</b>	The items players obtain or use should be displayed properly without significant delay
<b>Originator:</b>	Wenbin Yuan

## 11.2 Reliability and Availability Requirements

<b>Requirement: 46</b>	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> Very High	PUC:N/A
<b>Description:</b>	The game must be able to run at any day and any time
<b>Rationale:</b>	The players can play the game at any time they want.
<b>Fit Criterion:</b>	The game will be playable for any time

<b>Originator:</b>	
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<b>Requirement: 47</b>	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> Very High	PUC:N/A
<b>Description:</b>	The game must be completely playable
<b>Rationale:</b>	The players will have a complete gameplay experience and the game should not have crashed during that time.
<b>Fit Criterion:</b>	When the game starts, the player will not experience any unnecessary pauses. The components of the game will be working.
<b>Originator:</b>	Wenbin Yuan

<b>Requirement: 48</b>	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> Very High	PUC:N/A
<b>Description:</b>	The game must not crash during playtime
<b>Rationale:</b>	The players will have complete gameplay experience and the game should not be crashed during that time.
<b>Fit Criterion:</b>	When the game starts, the player will not experience any unnecessary pause. The components of the game will be working..
<b>Originator:</b>	Wenbin Yuan

### 11.3 Robustness or Fault Tolerance Requirements

<b>Requirement: 49</b>	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> High	PUC:N/A
<b>Description:</b>	The game must not crash even if the players presses the wrong key
<b>Rationale:</b>	The players might accidently press the wrong key during the game. The wrong key might lead to an incorrect action but the game must not crash.
<b>Fit Criterion:</b>	The game will respond to every player's input. If the key

	that the players presses does not lead to any action, the game will keep running and should not crash.
<b>Originator:</b>	Wenbin Yuan

#### 11.4 Capacity Requirements

<b>Requirement:</b> 50	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> Very High	PUC:5
<b>Description:</b>	The game should be able to generate enough items for the players to collect and interact with them so they can technically be able to survive with these items in game..
<b>Rationale:</b>	The number of items signifies the length of each round. The game should last for at least 15 mins for each round so there must be enough items for players to collect
<b>Fit Criterion:</b>	The items should be generated while loading the level and should not have significant delay
<b>Originator:</b>	Wenbin Yuan

#### 11.5 Scalability and Extensibility Requirements

This game does not have scalability and extensibility requirements

#### 11.6 Longevity Requirements

<b>Requirement:</b> 51	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> Very High	PUC:N/A
<b>Description:</b>	The game must have atleast 15 minutes of gameplay.
<b>Rationale:</b>	The players will first get used to the control of the game for around 2 turns. Then they will use around 4-8 turns to collect resources. Next for 8-11 turns the players will try to reach the other players and prepare to fight. Finally for 11-15 or more turns, the players will fight one another and try to win the game. Each turn has 30s, therefore the final product must be able to be played for at least 15 minutes.If the game is more competitive, the gameplay might take longer.
<b>Fit Criterion:</b>	The 15 minutes includes all player's actions

<b>Originator:</b>	Wenbin Yuan
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## 12. Operational and Environmental Requirements

### 12.1 Release Requirements

<b>Requirement:</b> 52	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> Very High	PUC:N/A
<b>Description:</b>	The game will be released to a set of stakeholders
<b>Rationale:</b>	The goal of the product is to present the game for 15 minutes to all the persons related to the capstone course
<b>Fit Criterion:</b>	The game will be able to provide at least 15 minutes of gameplay entertainment
<b>Originator:</b>	Wenbin Yuan

### 12.2 Expected Physical Environment

<b>Requirement:</b> 53	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> Very High	PUC:N/A
<b>Description:</b>	The game should be able to run on most Windows and Mac OS computer with Unity installed
<b>Rationale:</b>	The game must be able to run on most computers in campus
<b>Fit Criterion:</b>	The game must be able to run on most computers in campus
<b>Originator:</b>	Wenbin Yuan

## 13. Maintainability and Support Requirements

This game does not have maintainability and support requirements

## 14. Security Requirements

<b>Requirement:</b> 54	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> Very High	PUC:N/A



<b>Description:</b>	The game must not access and record any player's personal information
<b>Rationale:</b>	The game does not need any personal information
<b>Fit Criterion:</b>	Player will never be asked to input any personal information in game
<b>Originator:</b>	Wenbin Yuan

## 15. Cultural Requirements

<b>Requirement:</b> 55	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> High	PUC:N/A
<b>Description:</b>	The game shall not be offensive to any religious or ethnic group
<b>Rationale:</b>	Insulting any group of user results controversy.
<b>Fit Criterion:</b>	The game will not be offensive to any religious or ethnic group
<b>Originator:</b>	Wenbin Yuan

## 16. Legal Requirements

### 16.1 Compliance Requirements

<b>Requirement:</b> 56	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> Very High	PUC:N/A
<b>Description:</b>	The game shall adhere to all terms and conditions set by Unity
<b>Rationale:</b>	The game is created based on Unity and it must follow the terms and condition given by Unity.
<b>Fit Criterion:</b>	The game is created based on Unity and it must follow the

	terms and condition given by Unity.
<b>Originator:</b>	Wenbin Yuan

<b>Requirement:</b> 57	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> Very High	PUC:N/A
<b>Description:</b>	The game shall adhere to all terms and conditions set by the course and McMaster University's Academic Integrity Regulations
<b>Rationale:</b>	The game must follow the McMaster University's Academic Integrity Regulations
<b>Fit Criterion:</b>	The game must follow the McMaster University's Academic Integrity Regulations
<b>Originator:</b>	Wenbin Yuan

## 16.2 Standards Requirements

<b>Requirement:</b> 58	<b>Requirement Type:</b> Non-Functional
<b>Priority:</b> High	PUC:N/A
<b>Description:</b>	The game shall adhere to all terms and conditions set by the course and McMaster University's Academic Integrity Regulations
<b>Rationale:</b>	The game must follow the McMaster University's Academic Integrity Regulations
<b>Fit Criterion:</b>	The game must follow the McMaster University's Academic Integrity Regulations
<b>Originator:</b>	Wenbin Yuan

## 17. Project Schedule

<b>Deliverable</b>	<b>Date Required</b>	<b>Components</b>
High Concept Document(Rev 0 )	September 26, 2017	First revision of the game concept

Initial game goal. <ul style="list-style-type: none"> <li>determine the direction of the implementation.</li> <li>Dividing the work.</li> <li>Start to implement the game .</li> </ul>	October, 2017	Having basic game implementation starts
System Requirements (Rev 0 )	October 17, 2017	First revision of the system requirements
Sales Pitch Demo	October 17, 2017	Presenting the overall idea of the project, and demonstration of the demo(Not necessarily)
Game requirements	November 1, 2017	The requirements of the game
Continue working on the implementation. <ul style="list-style-type: none"> <li>Improve the game assets.</li> <li>Have basic gameplay works.</li> </ul>	November, 2017	The game will be playable basically and the players understands the strategy of the game at this point.
First demo	November 20, 2017	The short demonstration of the game, visual and audio art assets are not necessary, the basic idea of how the game is going to run
Implementation (Rev 0)	December 7, 2017	First revision of the game implementation
Continue working on the implementation. <ul style="list-style-type: none"> <li>Improve the game, after get feedback from the first demo.</li> <li>Have the most of the gameplay done.</li> </ul>	December, 2017	The most of the game should be completed. The game may have bugs.
Verification and Validation (Rev 0)	January 4, 2017	First revision of a verification and validation

Gameplay problems to be addressed. (feedback from other groups)	Mid February. 2017	Carefully reading all the feedbacks from the other groups and fix them.
Fix game bugs	End of February, 2017	Fix all the game bugs that are discovered by the other groups. After this stage, the game should run smooth and with no serious bugs.
Concept and all requirements (Rev 1)	February 27, 2017	Second revision of the high concept document and requirements
New Design Goal	Early april, 2017	Review the game, see if there are any improvement that we can do to make the game better.
Implementation (Rev 1)	March 29, 2017	Second revision of the game implemetation
New Design Goal		
Verification and Validation (Rev 1)	April 6, 2017	Second revision of a verifivation and validation
Final review of the game	Mid April, 2017	Make sure the game is complete and fun to play. Ready for the final demo,
Demo	April 20. 2017	A presentation and demonstration of the game

*All the date subject to change*

## 18. Risks

- a. If the project is not completed on time, the grade of the project will be affected.
- b. If the project is completed with lower quality, the grade of the project will be affected.

- c. If the project is copied from the other game, all the members of the group will be marked as academic dishonesty.
- d. The project need Unity to implement and may need many other external library for the support. It may take time to get used to the implementation.
- e. The different version of Unity might affect the compiling of the project.
- f. Unity does not support Git very well and a proper .gitignore file is needed

## **19. Costs**

- a. This capstone project will take about 6 months to build, and April 2018 is the deadline.
- b. This capstone project is used for McMaster University education purpose, money will not be a factor. the free version of Unity will be used for building the game.

## **20. User Documentation and Training**

- c. A document includes the Unity version, operating system and game controls is required.
- d. No training required, the game uses the same interaction devices as other PC 2Dgames.
- e. Game manual is provided for players to learn about this game.

## **21. Waiting Room**

- a. Online play system
- b. A selectable AI opponent so it can be played by one user
- c. Random generated map

## **22. Ideas for Solutions**

There's no ideas for solutions since there is nothing in waiting room.