**Supplementary Specification**

**Introduction**

This document is the repository of all “Need For Spear” Phase-1 Requirements not captured in the use cases and glossary.

**Functionality**

This section lists functional requirements that are common to more than one use case.

1. **System Error Shutdown**

Fatal system errors will result in an orderly restart of the game. In case of a shutdown, all game data shall be lost.

**Usability**

1. **Design for Ease-Of-Use**The design of the game should be easy to use and players should see every material on the screen easily during the game.
2. **Offline Help**

Players can get help in the game’s corresponding section whenever they are in need of help.

**Reliability**

1. **Recoverability**If the game shuts down imminently, the game should be able to restart.
2. **Availability**The game can be played at any time.

**Performance**

1. **Action Response Time**The system should respond to the actions of a Player without any redundant latency.
2. **Database Response Time**The system should access the database without any redundant latency.

**Hardware and Software Constraints**

“Need For Spear” can be played with a keyboard and a mouse. It is only supported in MacOS/Windows/Linux.

**Application-Specific Domain Rules**

**Building Mode Rules**

* Before running the game, the layout needs to be built.
* If Player enters the number of obstacles for each type that will be on the layout, the system can randomly build the game without any overlapping.
* Player can also build the game manually by putting obstacles on the layout.
* For each type of obstacles, there are minimum requirements as such:
  + 75 simple obstacles,
  + 10 firm obstacles,
  + 5 explosive obstacles,
  + 10 gift obstacles (each 4 ability should appear once)
* After the layout is created, Player can manually change any obstacle however he/she likes.
* None of the obstacles must not overlap each other.

**Running Mode Rules**

* L is the distance unit that will be used to decide the size of most of the particles in the game. It is equivalent to the 10% of the width of the game frame and Noble Phantasm’s length is equal to it.
* Noble Phantasm moves horizontally with A and D buttons. If the button is pressed and released, Noble Phantasm moves by L/2 with a speed of L/second, if the button is hold, it moves with a speed of 2\*L/speed until the button is released.
* Noble Phantasm’s thickness is 20px.
* There are 4 obstacles: simple, firm, explosive and gift.
  + Simple obstacles can be destroyed with one hit.
  + Firm obstacles can be destroyed with the number of hits that is written on them.
  + Explosive obstacles can be destroyed with one hit. Once they are destroyed, they explode and fall downwards. If they hit Noble Phantasm, the player loses one chance.
  + Gift obstacles can be destroyed with one hit. Once they are destroyed, they drop a box downwards that contains a magical ability.
  + Simple, firm and gift obstacles are rectangles with dimension L/5 and 20px. Explosive obstacle is a circle with a radius of 15px.
  + All rectangular obstacles have a probability of 0.2 to move horizontally if they have a space to move on the x-axis. Circular obstacles have the same probability to move horizontally on the space around them. During the movement, the obstacles do not collide with each other.
  + The movement speed of the moving obstacles is 0.25\*L/second.
* When a player destroys an obstacle, 300/(CurrentTime-StartTime) gets added to the total score of the player.
* There are four different magical abilities that a player can use:
  + Chance Giving Ability: When used, the player gets an extra chance if it has less than 3 chances.
  + Noble Phantasm Expansion: When used, Noble Phantasm’s length gets doubled.
  + Magical Hex: When used, two cannons appear on both ends of Noble Phantasm that can fire Magical Hexes. A Magical Hex can hit obstacles as if it's the Enchanted Sphere.
  + Unstoppable Enchanted Sphere: When used, the Enchanted Sphere becomes unstoppable and destroys everything it hits and does not deviate when it hits an obstacle.
* All abilities except Chance Giving Ability have a duration of 30 seconds.
* If an ability gets activated while a different ability is in use, both abilities can be used.
* If an ability gets activated while the same ability is already activated, 30 seconds gets added to the remaining duration of the previously activated ability.
* Enchanted Sphere has dimensions of 16x16px.
* If the Enchanted Sphere cannot hit Noble Phantasm and fall, Player loses a chance.