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CS 319 Course Project

Group 1C-SS

Analysis Report

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1. Introduction

Slay the Spire is a single-player, turn-based strategy game. The purpose of this game is to complete all the challenges on the map. At first, the player chooses a character to play in the game. The player starts the game from the beginning of the map with the chosen character. The map consists of different locations, which are rooms of hostile enemies, resting areas, treasure rooms, unknown rooms or merchants. The player has a deck of cards that can be extended via the merchants, treasures or fights. The deck is used during the turn-based fights. In each turn, several cards are randomly distributed to the player's hand from the deck. Then the player can use these cards for attack or defense purposes. At the resting areas, the player can rest or smith. If the player decides to rest, he gains some percentage of his health point, otherwise, the player can upgrade a card from his deck. In the treasure rooms, there are chests that contain various awards. The player can buy cards, potions or relics from merchants by paying the gold that he gained throughout the game. Potions and relics are the kind of buffs for the fights. In unknown rooms, the player may encounter enemies, treasures, shops or different events. The game is over when the player slays the boss at the final room of the map or when the player dies.

2. Current System

This is the explanation of the current game.

2.1. Characters

There are 4 characters you can play in [Slay The Spire](#) who differs at their starting HP (Health Point) , starting [relic](#) and the cards in their [deck](#)(See 1.3). While you start out with only the Ironclad, you can unlock additional characters as you progress through the game.

2.1.1. Ironclad

Ironclad starts with 80 hp, highest of the playable characters. His starting Relic is *Burning Blood* which heals 6 HP after combat. His starting deck consists of 5 Strike, 4 Defense and 1 bash card. His main stat is strength which allows several cards for the Ironclad see a huge boost in effectiveness. Some examples of Ironclad cards are shown in the Fig. 1.



Figure 1: Ironclad Cards

To see the rest of the cards that are unique to Ironclad, See: [Ironclad Cards](#)

2.1.2. Silent

Silent is a huntress themed character who weakens her foes with numerous cuts and poison, while using cheap tricks and agility to avoid their attacks. She starts with a relatively low 70 hp. Her starting Relic is Ring of the Snake which draws 2 additional cards when starting combat. Her starting deck consists of 5 strike, 5 defense, 1 survivor and 1 neutralize card. Her main stat is dexterity and one Dexterity corresponds to one extra Block per card. Some of the examples of Silent Cards are shown in the Fig. 2.



Figure 2: Silent Cards

To see the rest of the cards that are unique to Silent, See: [Silent Cards](#)

2.1.3. Defect

Defect is a combat automaton which became self-aware. It starts with 75 hp. The Defect's starting Relic is Cracked Core which Channels 1 Lightning at the start of each combat. Its starting deck consists of 4 strike, 4 defend, 1 zap and 1 dualcast card. Her main stat is Focus which is a stat that improves the effectiveness of your orbs.

The Defect has a unique mechanic, the Orbs. Using cards and Relics, The Defect Channels these elemental spheres into a set of Orb slots, activating their passive effects each turn or Evoking them for a one-time burst. The Defect begins with three Orb slots and considers the rightmost Orb to be the 'next' Orb to Evoke. Channeling an Orb inserts it into the rightmost empty slot. If every slot is full, each Orb will be shifted one slot to the right, popping the right-most Orb out of its slot and evoking it. If The Defect loses every Orb slot, it can't channel Orbs at all! The Defect can currently channel four types of Orbs - Lightning, Frost, Dark, and Plasma. Some examples of Defect Cards are shown in the Fig. 3.



Figure 3: Defect Cards

To see the rest of the cards that are unique to Defect and learning more about the orbs, See: [Defect](#)

2.1.4. Watcher

The Watcher is a monk that uses different *stances*(a unique mechanic to Watcher) to fight her enemies. She starts with 72 HP. Her starting Relic is Pure Water, which adds a *Miracle*(See below) to your hand at the start of each combat. Her starting deck consists of 4 strike, 4 defend, 1 eruption and 1 vigilance card. Examples of Watcher cards are shown in Fig. 4.

Stances are unique to The Watcher. There are 4 stances in the game:

Calm: Upon leaving this stance, gain two Energy.

Wrath: While in this stance, you deal and receive double the damage.

Divinity: Entering this stance, you gain 3 energy and within this stance you deal triple damage

Empty: This is when you are not in the other stances. It has no effects.



Figure 4: Watcher Cards

To see the rest of the cards that are unique to Watcher and learning more about the stances, See: [Watcher](#)

2.2. Cards

Cards are the main components of the players decks and they are used for attack, defence or strategic purposes. Each card has different properties and corresponding energy. Card can be classified in terms of their rarities, characters or types. There are five rarity classes which are basic, spacial, common, uncommon and rare cards. Classes of the cards according to their characters are Ironclad cards, Silent cards, Defect cards, Watcher cards, and Colorless cards. Cards with character names are specific to this character and other cards are neutral, which means they can be used by any of the character. There are five different types of cards and they are attack, skill, power, status, and curse cards. Properties of the cards are shown in the Fig. 5. Cards can also be upgraded from rest sites, with using other cards or via relics. Upgraded cards become powerful and name of the card is colored green. All cards can be found in here.



Figure 5: Card Explanation

2.2.1. Attack Cards

This type of cards are reusable and deals damage to the enemy during the fights. Some of these cards has secondary effect.

2.2.2. Skill Cards

This type of cards are reusable and can be used for strategic purposes. Each card has particular effects.

2.2.3. Power Cards

This type of cards can be played only once in each fight. They provide upgrade to the character when they are played.

2.2.4. Status Cards

This type of cards are unplayable and they are added to players deck during the fights and removed at the end of the fights. Status cards might have negative effect but their main purpose is to block user to draw beneficial cards from the deck.

2.2.5. Curse Cards

This type of cards are unplayable and added to the desk during the events. They remain in the players deck until the end of the run. They might have negative effects and they restrict player from drawing useful cards.

2.3. Game Mechanics

2.3.1. Deck

Each character starts the run with initial deck. Players can extend their decks via awards from the end of the fights, merchants or events.

2.3.2. Gold

As in many games, there is gold system in *Slay The Spire*. Each character starts the run with specific gold. However, this starting gold is not enough to complete the run successfully. Players can earn golds as a reward from fights that they encounter. Different types of enemies drops different amounts of gold. Normal encounter drops 10-20 gold, elite encounter drops 25-35 gold, and boss encounter drops 95-105 gold. Also, there are different ways to gain gold except killing monsters. The player can earn gold by result of events, effects of relics or power of cards. The gold gained throughout the run can be spent at the merchant to buy cards, relics or potions which is mandatory to complete run. Alternatively, gold can be spent by events that player encountered to gain rewards from that event.

2.3.3. Relics

Relics are important as much as cards in *Slay The Spire*. Relics provides passive bonuses to player and it remains until the end of the run. Each character starts the run with a relic that is specific to that character. These relics called Starter Relics. Relics are categorized by their rarity and the way that they can be obtained. Common, uncommon, and rare relics can be found from different sources such as fight reward and chest rooms. Boss relics are given to the player as a reward of boss encounters, events relics can only be found as a result of an event , and shop relics can only be bought by player with gold from the merchant. Relic examples are shown in the Table 1.

Relic examples:

	Burning Blood (Starter Ironclad) At the end of combat, heal 6 hp.		Lantern (Common) Gain 1 energy on the first turn of each combat.
	Mercury Hourglass (Uncommon) At the start of your turn deal 3 damage to all enemies.		Ice Cream (Rare) Energy is now conserved between turns.
	Snecko Eye (Boss) Draw 2 additional cards each turn. Start each combat confused.		Red Mask (Event) At the start of each combat, apply 1 Weak to all enemies.
	Sling of Courage (Shop) Start each elite combat with 2 Strength.		Circlet (Special) Looks pretty.

Table 1: Relic Examples

Currently there are 127 different relics in the game. The whole relic list can be found at [Relics](#).

2.3.4. Potions

Potions are items that player can use during any turn of combat. Potions can be used to change the fate of ongoing battles as they can provide buffs and positive effects to the player. Unlike the cards, potions does not require energy, which means player can use potions at any time he/she wants and that is the most significant feature of potions. Most of them are used only for once and then disappear. Player can hold up three potions at the same time normally. However, there is a common relic named “potion belt” which increases the number of potions that the player can hold by two. There are different ways to obtain potions in the game. They can be obtained as a reward after combat (slaying the boss named Neow may offer player 3 potions), they can be bought from a merchant with gold, they can be obtained by power of a card named “Alchemize” and finally they can be obtained as a effect of different relics named “Cauldron” and “Tiny House”. Potions are also categorized as their rarities. Potion examples are given in the Table 2.

		
Block Potion (Common) Gain 12 Block.	Duplication Potion (Uncommon) This turn, your next card is played twice.	Entropic Brew (Rare) Fill all your empty potions slots with random potions.

Table 2: Potion Examples

Currently there are 42 potions in the game. The whole potion list can be found at [Potions](#)

2.3.5. Buffs

Buffs are advantages that can be obtained from potions, cards or relics. Advantages are consist of in fight advantages, out of fight advantages, card picking advantages, deck advantages, player stat advantages and other miscellaneous advantages. If buff is taken from a potion or a card, advantage of it will last for a limited time. To exemplify, buff can be obtained at the start of combat and removed at the end or it can last for certain number of turns. However, when buff is taken from a relic, as long as the relic is equipped the advantage will last for the player. Advantages are unique to potions, cards or relics. Each potion or relic will give different advantages to the player. Some of these advantages can be stacked by duration or intensity and some may not. Using same buff for two times may double its last time or double its power values. Buffs are divided to two sections as Shared and Unique Player Buffs(UPB). Shared buffs can be found from enemies or in the player's arsenal. UPB's are granted to player. Content of the buff and its effect time is provided in the description box of potion, relic and card in the Table 3.

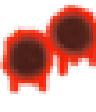
		
Berserk(UPB) At the start of your turn, gain X Energy.	Double Tap(UPB) Your next X Attacks are played twice.	Buffer(Shared) Prevent the next X times you would lose HP.

Table 3: Buff Examples

To see full list of Buffs please check: [Buffs](#)

2.3.6. Debuffs

Unlike the buffs, debuffs are disadvantages that can be obtained from cards, potions or relics. Disadvantages are in fight disadvantages that includes card picking disadvantages, deck disadvantages, player stat disadvantages and other miscellaneous disadvantages. As like buffs, debuffs may also stack by duration or intensity, and some may not stack. Same rules apply for intensity, duration and stacking. As an extra aspect, effects of debuff can be removed by Artifact Buff. Examples of debuffs are given in Table 4.

Debuff Examples:

		
Constricted (Spire Growth) At the end of your turn, take X damage.	Fasting (Fasting) Gain X less Energy at the start of each turn.	Hex (Chosen) Whenever you play a non-Attack card, add X Dazed to your draw pile.

Table 4: Debuff Examples

To see full list of Debuffs please check: [Debuff](#)

2.3.7. Score

Player is rated based on a score that is given by the accomplishments from the current run. Basically, score shows how player is progressed the game and to determine the place on leaderboard. Each accomplishment gives a specific score. Accomplishments are can be gained by killing, acquiring specific items, finding rare cards or completing specific events. For example player gains 25 score if the deck size exceeds 35. To see full list of achievement: [Score](#)

2.4. Map

Map is in the form of a tree. It consists of 7 different map locations. At the end of the map you face with a boss.

2.4.1. Enemies

Enemies are the form of oppositions faced in the game. There are 3 classes of enemies which are Monsters, Bosses, Elites. The class of the monster that player faces depends on the location of the map. In different locations, the player can fight with different type enemies. Also, when the player defeats the enemies, it can gain some benefits such as golds, relics, potions or new cards depending on the classes of the enemies.

2.4.1.1. Monsters

Monsters can be considered as “basic enemies” of the game. They land their icon on the map and will incur a battle one or more depending on the floor. When the player defeat a monster, it can gain coins, a selection of three cards or sometimes a potion. There are many type of monsters. According to their classes, they have different special powers, attack patterns, encounter chance in the map. Also, some of the monsters are unique to their acts and some of them have different powers in different acts. A monster examples are shown in Table 5, Table 6, and Table 11.

To see full list of Monsters please check: [Monsters](#)

Monster Example:

Pattern: The Cultist always starts with Incantation, then uses Dark Strike every turn after.

Cultist

HP: 48-54 50-56(Ascension 7+)
Debut Act: All acts
Powers: None

Table 5: Cultist

Ritual

Description: At the end of its turn, gains X_Strength
Type:Buff
Stacking Behavior: Intensity

Table 6: Ritual

Name	Intent	Effect
Incantation		Gains 3 Ritual.
Dark Strike		Deal 6 damage

Table 7: Ritual's Behaviours

2.4.1.2. Elites

Elites are stronger monsters that are marked separately from normal ones on the map. As Elites are the one special kind of the Monsters, they might have the all features that Monsters have such as attack pattern, special power, different powers in different acts and being unique to a specific act. If the player defeat an Elite, it can get score bonus and random relics. As they are too strong, it is not always a good idea to fight them. However, the relics granted by Elites might be very powerful. Therefore, the player should think the trade-off by considering power of its deck. Also, there are some relics that are specifically created to defeat Elites:

- Sling of the Courage: The player will start each elite combat with 2 strength.
- Preserved Insect: All enemies found in elite rooms will start combat with 25% less health point.
- Black Star: When the player defeat an Elite, the Elite grants 2 relics instead of 1.

An example of Elite type is given in Table 8 and Table 11.

To see full list of Elites please check: [Elites](#)

Elite Example: Gremlin Nob

Pattern: It always start with Below. It has 33% chance of using Skull Bush and %67 chance of using Rush. It cannot use Rush 3 times in a row.

Gremlin Nob

HP: 82-86
Debut Act: Act 1 and Act 2
Powers: None

Table 8: Gremlin Nob

Name	Intent	Effect
Bellow		Gains Enrage 2.
Rush		Deal 14 damage
Skull Bush		Deal 8 damage and apply 2 vulnerable

Table 9: Gremlin Nob's Behaviours

2.4.1.3. Bosses

At the each o Act, the player encounters one of the three Bosses for an act. The Boss fight is denoted in the map by a icon at the very top. Each Boss has unique icon shown at the top of map. The player can create a strategy by looking the type of the Boss. Just before reaching the Boss fight, there is always a Rest Site. However, there is an exception for the last Boss, there is an elite in the previous room of the last Boss. When the player slays a Boss, 50 points will be added to the score. Slaying a Boss without taking damage adds additional 50 points and slaying 3 bosses without taking damage provides extra 200 points. Also, there is a relics whose name is Pantograph that can heal the character 25 point at the start of each Boss combat. Defeating a boss provides some extra benefits. For instance, if the player defeats the Act 1 or Act 2 bosses, the player is rewarded with gold, a potential random potion, a choice between 3 rare cards and a choice between 3 Boss relics. One of the bosses and its behaviours for each Act is listed in Table 10 and Table 11.

To see full list of Bosses please check: [Bosses](#)

Boss Example: Slime Boss (Act 1)

Slime Boss

HP: 140
Debut Act: Act 1
Powers: Split (If it dropped to or below 50% health will get their turn interrupted, and will split into two smaller slimes as their new turn action)

Table 10: Slime Boss

Name	Intent	Effect
Goop Spray		Shuffles 3 Slimed to your discard pile.
Preparing		Nothing.
Slam		Deals 35 damage
Split		Splits into an Acid Slime (L) and a Spike Slime (L) with current HP. Interrupts previous intents.

Table 11: Slime Boss Behaviours

2.4.2. Merchants

This is a shop where a merchant sells his wares. In these rooms the player can buy cards, relics, potions or can remove a card from his deck by paying Gold. The merchant sells 5 colored cards, 2 colorless cards, 3 relics and 3 potions. One of the colored cards is always on sale by 50%. Colored cards consist of 2 attack cards, 2 skill cards and 1 power card, while colorless cards consist of 1 uncommon card and 1 rare card. One of the relics sold is a special type called Shop Relic. This kind of relics can only be found in shops. The price range for cards, relics and potions are shown in Table 12.

Colored cards:	Common (45 - 55 Gold) Uncommon (68 - 82 Gold) Rare(135 - 165 Gold)
Uncolored cards:	Uncommon (81 - 99 Gold) Rare(162 - 198 Gold)
Relics:	Common (143 - 157 Gold) Uncommon (238 - 262 Gold) Rare (285 - 315 Gold) Shop (190 - 210 Gold)
Potions:	Common (48 - 52 Gold) Uncommon (72 - 78 Gold) Rare (95 - 105 Gold)

Table 12: Merchant Prices

The card removal service can be used only once per Merchant. Its price is initially 75 gold, however, it increases by 25 golds each time it is used. Also, some of the relics are interactive with the shops. These relics and their functionalities over shops can be found in Interactions part of this [link](#).

2.4.3. Rest Sites

Rest sites offer two options to the player by default: Rest and Smith. The player can only choose one of the options at each Rest Site. If the player chooses the Rest option, his character heals by 30% of its max HP. The Smith option offers the player to upgrade one card of a wished card. These options can be extended by some of the relics as follows:

- Lift (added by Girya): Permanently gain 1 [Strength](#) (maximum of 3 uses).
- Doke (added by [Peace Pipe](#)): Permanently remove 1 card from your deck
- Dig (added by [Shovel](#)): Gain a random [Relic](#)
- Recall (available in normal runs when [Act 4](#) is unlocked): Obtain the [Ruby Key](#)

Some relics interact with the Rest Site in a different way rather than adding a new option:

- Ancient Tea Set: Whenever the player enters a Rest Site, he/she starts the next combat with 2 Energy.
- Coffee Dripper: The player can no longer rest at Rest Sites.
- Dream Catcher: Whenever the player chooses Rest option, he/she gets a random card reward choice.
- Eternal Feather: Upon entering a Rest site, heal for 3 HP per 5 cards in the deck.
- Fusion Hammer: The player can no longer smith at Rest Sites.

2.4.4. Unknown

Unknown Location, also known as ? rooms, is a map location where the character may encounter an Event, Monster, Shop or Treasure Room. The chances of these encounters when first entering the unknown room are: Monster: 10%, Treasure: 2%, Shop: 3%, Elite: 10%, Event: if no other encounter is found.

2.4.4.1. Events

Events can appear in Unknown rooms on the map. Events are divided into 4 sections.

2.4.4.1.1. Common Events

These events can appear in any of the first three Acts. Some of the common events are Face Trader, The Divine Fountain, and Duplicator out of 16. The rest of Common Events and the details of events can be found at [Events](#)

2.4.4.1.2. Act 1 Events

These events can only appear in the first Act. Some of the Act 1 events are Big Fish, Scrap Ooze, The Cleric, World of Goop, and Shining Light out of 11. The rest of Act 1 Events and the details of events can be found at [Events](#)

2.4.4.1.3. Act 2 Events

These events can only appear in Act II. Some of the Act 2 events are [Bandits](#), [The Nest](#), [Old Beggar](#), [Knowing Skull](#), and [The Mausoleum](#) out of 16. The rest of Act 2 Events and the details of events can be found at [Events](#)

2.4.4.1.4. Act 3 Events

These events can only appear in the third Act. Some of the Act 3 events are [Sensory Stone](#), [Secret Portal](#), [Winding Halls](#), [Sphere](#), and Falling out of 8. The rest of Act 3 Events and the details of events can be found at [Events](#).

2.4.5. Treasure Room

Treasure room is a map location shown with a chess icon map. In these rooms gold and relics can be found. It is also possible to go to this room from the unknown location.

2.5. Game Set-Up

When you open the game, the main menu welcomes the player. You have 5 options: You can go and directly start your adventure by choosing your character, change the settings, see your stats, see the compendium or quit the game. There is also a submenu that allows you to change your save slot, see your playtime and completion rate.

2.6. Game Play

Slay the Spire is a combination of a Roguelike and a deckbuilding game. Which means it is a role playing game that consists of procedurally created levels, turn-based fights, permanent deaths and deck building. At each start of a new playthrough, player encounters a whale-like creature Neow. Depending on last run's record, Neow(NPC) offers some starting bonuses. If boss of the first Act is not encountered in the previous run, then Neow offers +%10 Max HP or [Neow's Lament](#). Otherwise, Neow offers 4 starting bonuses which are 2 beneficial options (relic, gold, cards, potions, card upgrade), 2 trade-offs , giving all gold or sacrificing HP to get a starting bonus or giving up starting relic to acquire a random boss relic.

After selection, player is transported to Act 1 Map. Each room of map is randomly generated at each run. So the player faces with different maps each play. Player tries to reach final room of Act with successfully finishing rooms that are encountered. After defeating the current Act's boss player will proceed to the next Act's map. Defeating Act 3's boss will result as win. However, if player dies in the run all progress is lost and new run starts as explained above.

2.6.1. Fights

Player has to defeat the enemy in unknown, elite or enemy rooms to proceed. These combats are carried out as turn-based card game. Each fight splitted into turns, each turn opponents have a chance to make a move, after making his moves turn changes to other opponent. In each turn player draws 5 cards from his deck and gets 3 Energy points to spend in this turn. Playing a card reduces some energy points that is equal to cards cost. Player can play cards as long as there are cards in his hand and have adequate amount of energy. At the end of the turn, played cards and unplayed cards in hand are moved to discarded pile. If player's deck gets empty, the discarded pile is shuffled back to deck. The one who loses his all HP loses the fight.

If player can defeat the enemy, 3 cards are offered to player to add one of them to deck along with some gold and rarely a random potion. If the defeated enemy was harder than average player is rewarded with an additional Relic along with the others.

2.6.2. Acts

The game has 4 levels called Acts. Each Act is a map which has all map elements and a boss fight at the end. Difficulty of each Act is more than its previous Acts. The enemies to be faced is particular to the Acts. Here is the list of it:

Act I: The Guardian, Hexaghost, Slime Boss, Gremlin Nob, Lagavulin, Sentry

Act II: Bronze Automaton, The Champ, The Collector, Gremlin Leader, Taskmaster, Book of Stabbing

Act III: Donu and Deca, Awakened One, Time Eater, Reptomancer, Giant Head, Nemesis

Act IV: Corrupt Heart, Spire Shield, Spire Spear

Detailed information about the enemies can be found on Act tabs at

https://slay-the-spire.fandom.com/wiki/Slay_the_Spire_Wiki#Act%20I

2.6.3. Ascension

Ascension is a game mode which comes with different negative effects to increase the difficulty of the game. Mode is unlocked for one character when player beats all three acts with that character. In order to unlock the next Ascension player has to finish the previous Ascension. Losing the game in an Ascension level does not decrement the level. Also, losing the game in Act 4 still unlocks the next Ascension level. Negative effects of each Ascension level can be stacked. To exemplify; when playing Ascension Level 3, it's negative effects will be added to Level 1's and Level 2's effects.

To see all challenges added to game: [Ascension](#)

2.6.4. End Of the Game

The game ends if the HP of the player becomes zero. If the player successfully beats the enemies with positive HP, it completes the acts one by one. Then ascension mode becomes available. If player can complete ascension mode, It means the end of the game with that particular character.

3. Proposed System

3.1. Overview

In the current system, there is no hard, medium and easy mode. Most of the players complain about this problem because the game is relatively hard. Therefore, we plan to add game modes such that easy, medium and hard. Due to these game modes, every player can play the game in different modes they want. Also, to improve the game experience, we add save mode to start the checkpoints which are critical points in the map when player die. To increase the diversity in the game, we want to add extra characters, cards, events, enemies, card features, monster skills, fighting rooms. The most important additional feature is adding Pet. Pets are kind of assistants that accompanies the player during the fight and provides some extra features to player. The new card crafting system will be added. Due to crafting system, new cards can be created by merging two cards or merging a card with different essences. Lastly, level system will be added. Due to level system, the player can increase his level with the experiences gained throughout the game. Increasing level will provide stat points that can be used as gaining new skills from the skill trees.

3.2. Functional Requirements

3.2.1. Game Modes and Save Option

There will be three different game modes, which should be selected before starting the run.

Easy: There will be less elite rooms and player can save the progress.

Medium: There will be more elite rooms and player can save the progress.

Hard: There will be more elite rooms and player can not save the progress.

3.2.2. Characters

Master



Figure 6: Master

Brown Energy : The Master's energy icon.	
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Table 13: Master's Energy Icon

Behind every hero there is a master who prepares him to battle. Meet with the master of all characters in Slay the Spire, “The Master”. Master is a new character for the game who teaches our other characters in same war school. As he is their master he can use all of cards that specific to other characters. He starts with 78 HP which is really good when it is consider that his student Ironclad is the highest with 80 HP. Master’s character image and energy icon shown in Fig. 6 and Table 13 respectively.

Starting Deck

His starting deck includes different cards from different characters’ starting deck.

- 4 Strike cards from each character.
- 4 Defend cards from each character.
- 1 Vigilance
- 1 Survivor
- 1 Zap

Starting Relic

The Master’s starting relic is “Medal of Experience”, which ables Master to have an extra energy each round.

Master has no specific strategy. Basically you can use all strategies from other characters if you can correctly collect required cards.

3.2.2.1. Character skins

For all characters as player kill elites or bosses, and complete acts, there is a chance to gain permanent skins such as hair styles, armors, swords, daggers, wings, helmet and crowns. When a skin gained it becomes usable for each time new game starts. There will be skins tab on main menu and player will be able to wear any skin part as he wish for all characters.

As in other games, skins will only be for appearance and won't affect the gameplay.

By adding this aspect, we want players to customize their characters as their wish. The aim is to increase connection between player and characters, thus enjoyment they get from the game.

3.2.3. Cards

3.2.3.1. Ironclad Cards

Newly added Ironclad Cards is shown in Table 14.

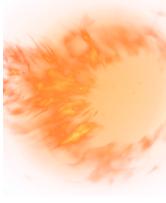
Name	Picture	Rarity	Type	Energy	Description
Fire Breath		Uncommon	Attack	2	Deal 5 damage to ALL enemies, and applies 4 burning effect to ALL enemies (like poison)
Block Penetration		Rare	Skill	1	Attack cards played in this turn will ignore the block of the enemy and deals real damage.

Table 14: New Ironclad Cards

3.2.3.2. Silent Cards

Newly added Silent Cards are shown in Table 15.

Name	Picture	Rarity	Type	Energy	Description
Block King		Uncommon	Skill	2	Exhaust. Adds 4 Block cards to the draw pile and they are available only for this fight. Each added card costs 1 energy and has blocking of 6.
Sharpened Sword		Rare	Attack	2	Deal 7 damage to all enemies for each skill card in your hand.

Table 15: New Silent Cards

3.2.3.3. Defect Cards

Newly added Defect Cards are shown in Table 16.

Name	Picture	Rarity	Type	Energy	Description
Frostbolt		Common	Attack	1	Freeze target enemy for 1 turn(enemy can not do action). If enemy is already freezed deal 15 damage.
Make It Colder		Rare	Skill	2	Apply freeze effect(enemy can not do his action) to ALL enemies

Table 16: New Defect Cards

Curse Of The Three is a defect card that costs 3 energy and it's rarity is rare. It's a skill type card. If player's orb slots are full, evoke each orb and then channel evoked orbs. Evoked orb shifted to right and when all orbs are evoked, from starting the first evoked orb, orbs channelled. So, after using the card, orbs will be placed as y-axis mirror image of previous places. Card can't be played when orb slots are not full.

3.2.4. Events

Hogwarts stairs:

When this event occurs, player can create a path and move to one of the parallel roads in the map. If the current distance of that unknown room from the starting point is n , user can create a path to another room whose distance is at most $n+1$ from the root. It can appear in any of the three acts.

Master of Destiny:

When player encounters with Master, Master offers a deal which reveals all unknown rooms in current act for a specific amount of gold. If player accepts, gold is removed and events that are in the unknown rooms will be presented in the map. If player rejects unknown rooms will be stay hidden.

Master of Bets:

Encountering with Master of Bets enable user to consider a choice which is betting yourself on a combat. Player teleported to a battle arena and fights against a monster. If player wins against the monster, gains two times of the gold he bet. If player loses, bet gold is lost. All the effects and changes because of the combat does not apply to the rest of the game. Only thing that can be changed after the combat is player's gold. Bet amount is decided by the player. Opponent is decided based on the bet amount, increased bet amount results as a harder opponent.

Sacrifice Feast:

This event involves a trade off between pets and relics. A witcher offers to sacrifice a pet that is possessed by player. Sacrificing a pet will make player gain a random relic. Rejecting the offer causes a random debuff on player that lasts a limited time.

3.2.5. Pets

Pets are the kind of assistants for the player. The player can hold 3 pets in the slots. It can take any pets for the fight room. The player cannot control the pets. The Pets have special skills. These skills are the different behaviours that might include attack, defense etc.. All of the skills are explained in the below table. There will be 5 different pets in the game. As the total number of the pets that the player can hold, the player having 3 pets should discard one of the pet to get new dropped pet. Player might create different strategy by choosing different pets for the different fight rooms. Newly added pets are shown in Table 17.

Name	Picture	Probability of Drop	Skill
Brownie		Common	Has a %35 chance of feeding some of himself to the hero and remove his debuffs. The chance decreases by %5 every time he injures himself.
Eggplanted		Common	Has a %5 chance of exploding and giving 20 damage to all enemies. If he explodes, he is removed from the fight.
HoneyTree		Uncommon	Has a %20 chance of stopping enemy attack by covering his hero with a honey block(if enemy is willing to attack). Has a %30 chance of applying 10 weak on the enemy by applying honey poisoning.
Horsewoman		Uncommon	Has a %40 chance of enchanting the enemy with her beauty and causing him miss his attacks with a %70 chance. She can enchant multiple enemies at once.
Molegen		Rare	Has a %10 chance of one shotting a non-elite monster. Has a %20 chance of stealing random amount of gold from the enemy.
Dicetopus		Rare	Has a %10 chance of stunning all enemies. Has a %10 chance of stunning the player.

Table 17: New Pets

3.2.6. Card Crafting

Card crafting becomes a third option in the rest sites. If player chooses this option, It will be asked to choose three cards that are going to be crafted. Then these three cards will be removed from the deck and one of the stronger cards from these three cards will be randomly chosen and added to the players deck.

3.2.7. Level

There will be experience point associated with character. Character will gain 1 experience point from monsters, 2 experience points from elites, and 3 experience points from bosses. After gaining 10 experience points, level of the character will be increased. In each level, player can add one more primal buff permanently to player.

3.2.8. Enemies

3.2.8.1. Monster

Wendigo:

Wendigo is a monster that can be encountered in Act 3. It is so fast and has really sharp claws. As it is so fast, it has unique feature that Wendigo always do his action before player at the start of battle. There is no chance to react to Wendigo's first move. Wendigo's attributes and behaviours shown in Table 19 and Table 18 respectively.

Pattern : Every round, Wendigo has %75 chance to use Claw Attack, and %25 chance to use Scary Scream.

Name	Intent	Effect
Claw Attack		Deals 9x2 damage.
Scary Scream		Wendigo scares the player and applies 3 Weak.

Table 18: Wendigo's Behaviours

Wendigo

HP: 100-105 110-115(Ascension 7+)
In Party With: None
Debut Act: 3
Powers : None

Table 19: Wendigo

Ice Golem:

Ice golem is a monster that can be encountered in Act 2. His power comes from his ability to apply stun and weak. Along with this, his icy skin creates a disadvantage in the long run. For every 10 less HP from his max HP Golem takes 1 additional damage. Ice Golem's attributes and behaviours are shown in Table 21 and Table 20 respectively.

Pattern: Golem always starts with Punch. In the remaining turns, Golem applies Stun for 1 turn with a chance of %20. Or with a %50 chance Golem weaks the opponent for 1 turn. For the turns that Golem doesn't apply stun or weak, he goes with Punch for that turn.

Name	Intent	Effect
Freeze		Deals 14 damage and stuns for 1 turn.
Shiver		Deals 10 damage and applies weak for 1 turn.
Punch		Deals 10 damage.

Table 20: Ice Golem's Behaviours

Ice Golem

HP: 130-150 150-185(Ascension 7+)
In Party With: None
Debut Act: 2
Powers: None

Table 21: Ice Golem

3.2.8.2. Elite

Frozen Phoenix:

The frozen phoenix is an Elite enemy found only on the second act of the Spire. It is basically iced bird and can be rebirth one time as it transforms into egg after death. After 2 rounds of egg form he transforms into bird form again and continue to fight. Tricky point of this elite is that you should hit as much as you can when it transforms into egg form to lower his health point as much as possible, before it again starts to attack. Frozen Phoenix's attributes and behaviours are shown in Table 22 and Table 23 respectively.

Pattern : Phoenix starts with Encourage. Every round, Phoenix has an %80 chance of using Cold Blow and %20 chance to use Encourage. After it dies, for once, it transforms into egg form while its health point gets full. Egg form remains 2 rounds and Phoenix transforms into main form with same pattern.

Frozen Phoenix

HP: 140-150 150-160(Ascension 7+)
In Party With: Ice Golem
Debut Act: 2
Powers : None

Table 22: Frozen Phoenix

Name	Intent	Effect
Cold Blow		Deals 3x6 damage by blowing its cold wind.
Encourage		Itself and Ice Golem gain 3 Strength and 10 Block.
Egg Form		It transforms into egg form when it dies first time and its hp got full again. But stays in egg form for 2 rounds which it cannot do any actions.

Table 23: Frozen Phoenix's Behaviours

Nightingale Of Death:

The Nightingale Of Death is an Elite encounter which can be found in the second act of the game. He uses two swords with a harmony. This harmony makes him posses two powers that are special to him. His attacks can't be affected by blocks. Even if the opponent has blocks available, his attacks reduce the health points of the opponent. The other power is dealing extra damage for every three mark. Attacks of him leave one or two marks on the opponent and when third mark is applied opponent takes an extra damage. So, it is important to avoid long fights from him and not to waste energy with playing block cards. Nightingale Of Death's attack pattern behaviour and his attributes are shown Table 24 and Table 25.

Pattern : There are three possible actions of Nightingale to perform in turns. There is a %20 chance of performing Double Mark Stab and %80 chance of performing Single Mark Stab. And for every time Nightingale loses his %25 of max HP, he heals himself by %10 of his missing health rather than attacking. When Nightingale heals himself all the marks on the opponent is cleared, if there is any.

Nightingale Of Death

HP: 120-140 160-180 (Ascension 8+)
In Party With: None
Debut Act: 2
Powers: Know No Shield, Jack The Ripper

Table 24: Nightingale Of Death

Name	Intent	Affect	Ascension 8+
Single Mark Stab		Deals 15 damage and applies one mark to the opponent.	Deals 25 damage and applies one mark to the opponent.
Double Mark Stab		Deals 35 damage and applies double mark to the opponent.	Deals 45 damage and applies double mark to the opponent.
Explode Mark		Deals %15 of the remaining health of the opponent as damage.	Deals %25 of the remaining health of the opponent as damage.

Table 25: Nightingale Of Death's Behaviours

3.2.8.3. Boss

Ghost Knight	
	
HP:	140-150 150-160(Ascension 7+)
In Party With:	None
Debut Act:	3
Powers :	None

Table 26: Ghost Knight

Ghost knight is an ethereal and eternal creature that uses the spear he stole from the god's ammunition.

Pattern: He starts every game with charge. Has 90% chance to use charged spear after charge. Has 50% chance of spear attack, %25 chance of knife throw and %25 chance of charging when he is in non-charged state.

Name	Intent	Effect
Charge		Gains 20 block.
Charged Spear Attack		If his previous move was charge he deals 60 damage. Using this skill on hero's pet kills it immediately
Spear attack		Deals 20 damage.
Knife throw		Deals 4x4 damage. Gets healed for damage dealt.

Table 27: Ghost Knight's Behaviours

Little Fire

HP: 140-150 150-160(Ascension 7+)
In Party With: Ice Golem
Debut Act: 4
Powers : None

Table 28: Little Fire

Little Fire has been to hell and back, and back to hell...and back. He is using the black magics he learnt in the hell from the devil to bring evil to the world.

Pattern: He uses meditate by %30 chance when he has health lower than %50 otherwise he can't meditate. Normally he has %33 chance to use other skills.

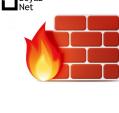
Name	Intent	Effect
Dragon breath		Deals 20 damage. Removes all the buffs on the hero. Gives 5 burning+ cards to hero's draw pile.
Hammer Slam		Deals 15 damage and stuns the hero.
FireWall		Gain 10 block. Reflect %50 of the damage received next 2 round.
Oxygen Supply		By meditating, he increases his oxygen levels and heals for 50. While meditating he receives %50 weak debuff.

Table 29: Little Fire's Behaviours

3.2.9. Relic

Our new relics that added to game are shown in Table 30 and Table 31.

God's Blessing

Description : Protects person from critical deadly damage. (If player dies current damage of monster, this relic protects player from death for once. Player gets no damage as the result.)
Rarity : Rare
Class : Any

Table 30: God's Blessing

Medal of Experience

Description : It ables player to has an extra energy for each turn.
Rarity : Starter
Class : Master

Table 31: Medal Of Experience

3.3. Non-Functional Requirements

3.3.1. Usability

- Our interface will be easy to understand which means user who had played at least one game on the computer should be able to fully understand how to play this game under 1.5 hours.
- Starting a game should be at most 2 clicks far from opening screen.

3.3.2. Reliability

We will use exception handling mechanics to prevent errors. If game somehow crushes an appropriate error message will be shown, and game will be saved in order to prevent progress loss. The probability of a game crush when taking actions will be lower than 0.1% and probability of losing map progress will be lower than 0.001%.

3.3.3. Performance

Performance restrictions are considered to have a fluent and faster game experience. Constraints can be listed as:

- Whenever any card is played, effect of the card will be active after less than 0.1 seconds.
- When the user enters to room, room will be ready on the screen in less than 0.5 seconds.
- Whenever character buys any card, potion or relic from the merchant or gains as a result of any event or as a reward, that item will be added to the inventory of the user less than 0.25 seconds.

3.3.4. Supportability and Implementation

Our program will be implemented using Java and it will be working in any platform with using of JRE 8 support.

3.4. System Models

3.4.1. Use Case Diagram

3.4.1.1. Use Case Diagram of Menu

Fig. 7 shows the use diagram of the Menu.

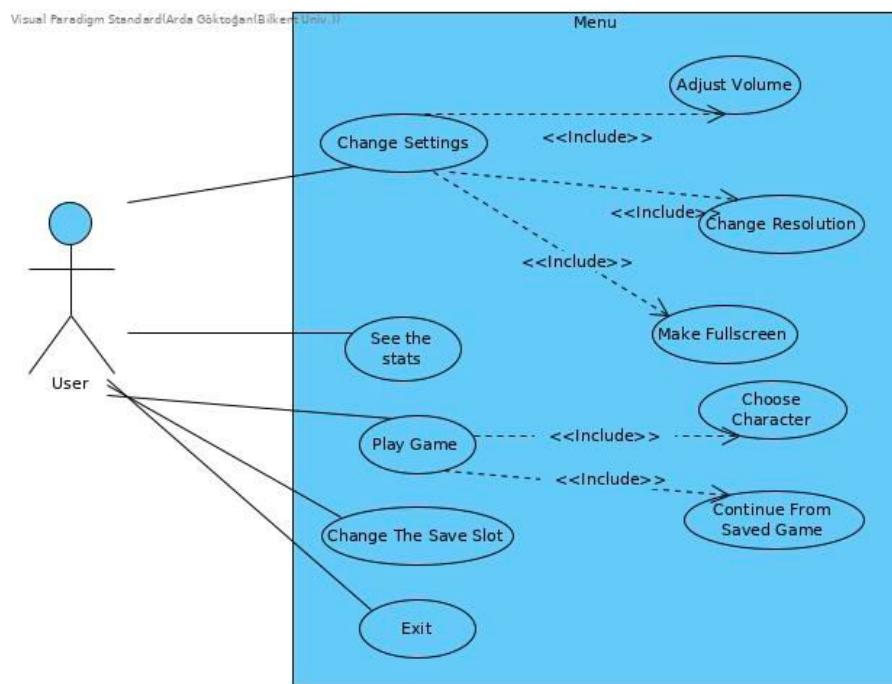


Figure 7: Use Case Diagram of Menu

Use case name	Change Settings
Participating actors	Player
Flow of events	<ol style="list-style-type: none">1. Player opens the settings menu2. Setting options will be displayed
Entry condition	Player should be in the menu
Exit conditions	Player invokes main menu back.

Use case name	Adjust Volume
Participating actors	Player
Flow of events	Player adjust the volume
Entry condition	Player should be in the Change Setting Menu
Exit conditions	Player returns main menu.

Use case name	See stats
Participating actors	Player
Flow of events	Player sees the events.
Entry condition	Player evokes stats screen.
Exit conditions	Player turns to menu screen.

Use case name	Play Game
Participating actors	Player
Flow of events	<p>1. Player calls for game starting</p> <p>2. Player chooses for how to start game</p>
Entry condition	Player envokes for playing game
Exit conditions	Player starts the game

Use case name	Start new game
Participating actors	Player
Flow of events	1. Player invokes for new game
	2. Player chooses the character and the game starts.
Entry condition	Player should be on the Play Game page.
Exit conditions	New game starts

Use case name	Continue from saved game
Participating actors	Player
Flow of events	1. Player invokes for saved game
	2. Player chooses the saved game that he or she wants to start
	3. Game starts
Entry condition	Player should be on the Play Game page
Exit conditions	Saved game starts
Special Requirements	Player can only see his or her saved games and can not see the other players saves.

Use case name	Change the save slot
Participating actors	Player
Flow of events	<p>1. Player invokes for the all players save slot page.</p> <p>2. Chooses the player that game will continue with.</p> <p>3. Game continues from that player.</p>
Entry condition	Player should be on the menu page
Exit conditions	Player chooses the player slot that will continue with.

3.4.1.2. Use Case Diagram of Map

Fig. 8 shows the use case diagram of the Map event.

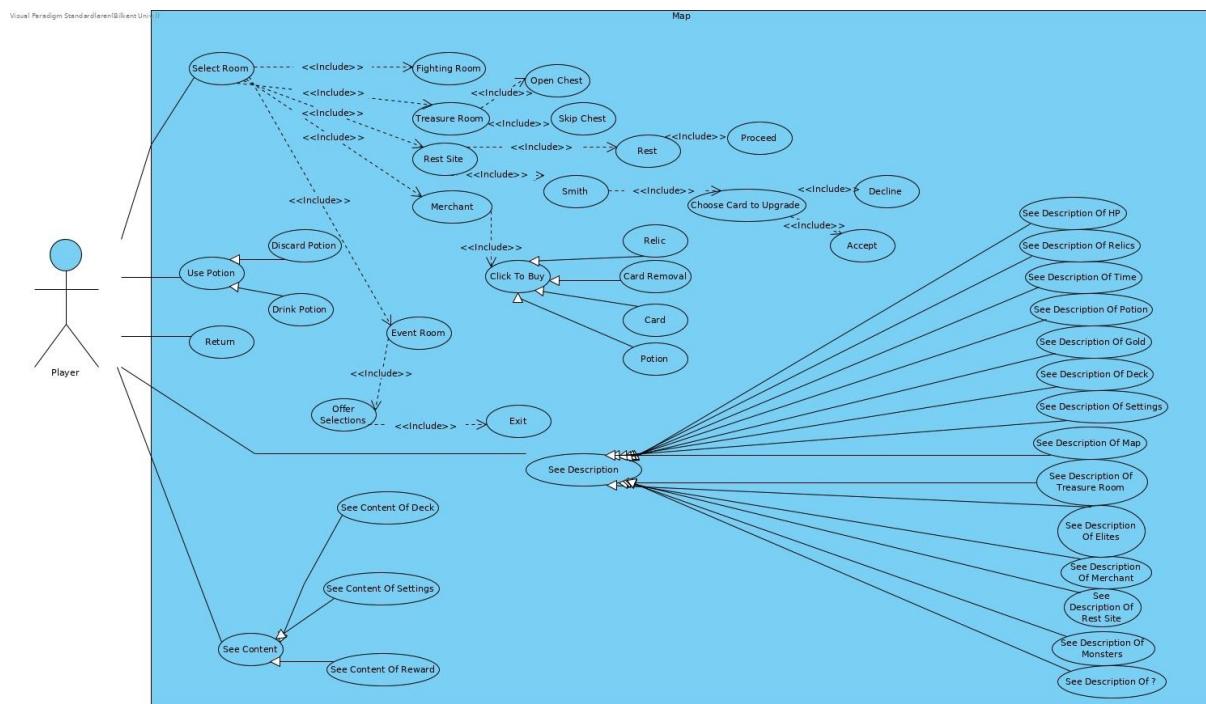


Figure 8: Use Case Diagram Of Map

Use case name	Select Room
Participating actors	Initiated by Player
Flow of events	Player enters the room
Entry condition	The user invokes “Select Room” use case
Exit conditions	The player invokes “Fighting Room”, “Treasure Room”, “Rest Site”, “Merchant” use case.

Use case name	Select Pet
Participating actors	Initiated by Player
Flow of events	The player selects a pet to enter the room with.
Entry condition	Player on the map screen

Use case name	See Description
Participating actors	Initiated by Player
Flow of events	<p>1. The user invokes the “SeeDescription” use case.</p> <p>2. Description of the object is displayed.</p>
Entry condition	The cursor enters over the object.
Exit conditions	The cursor exits from the object.

Use case name	See Contents
Participating actors	Initiated by Player
Flow of events	<p>1. The player invokes the “SeeContents” use case</p> <p>2. Screen zooms in to the object and the contents of that object are displayed.</p>
Entry condition	Player clicks on the desired object.
Exit conditions	Player clicks on the “return” button.

Use case name	Return
Participating actors	Initiated by Player
Flow of events	The player returns to rewards screen from last battle.
Entry condition	The player selected the card

Use case name	Use potion
Participating actors	Initiated by Player
Flow of events	<p>1. The player invokes the clicks on the desired potion</p> <p>2. The player either drinks the potion and effects of the potions are applied, discards the potion or cancels the action.</p>
Entry condition	The player clicks on the desired potion.
Exit conditions	Player returns to the fighting room.

3.4.1.3. Use Case Diagram of Fights

Fig. 9 shows the use case diagram of Fight event.

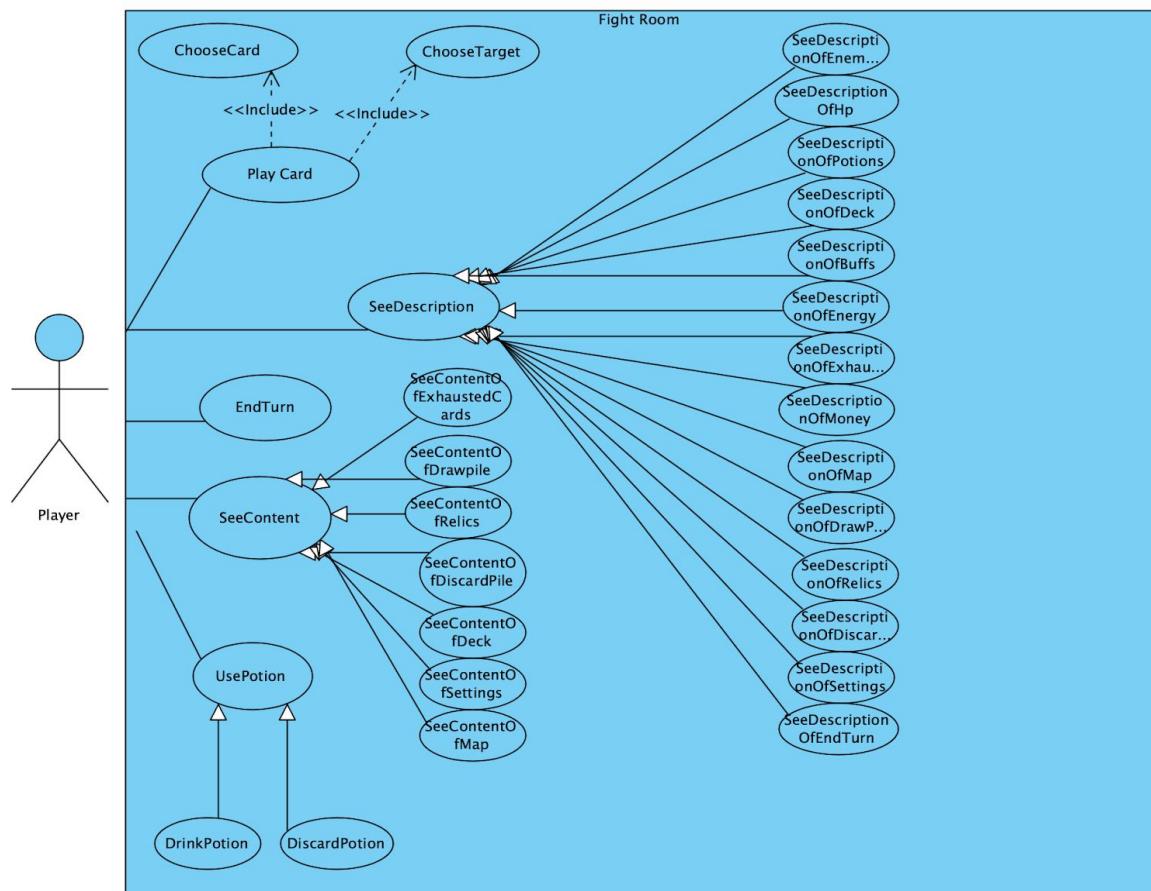


Figure 9: Use Case Diagram Of Fights

Use case name	PlayCard
Participating actors	Initiated by Player
Flow of events	<ol style="list-style-type: none"> 1. The user invokes the “ChooseCard” use case 2. The user invokes the “ChooseTarget” use case 3. The effects of the cards are applied.
Entry condition	The user invokes “ChooseCard” use case.
Exit conditions	The player invokes “ChooseTarget” use case or exits from the ChooseCard use case

Use case name	ChooseCard
Participating actors	Initiated by Player
Flow of events	The player selects a card to play
Entry condition	Its player's turn.
Exit conditions	The player chooses the card.

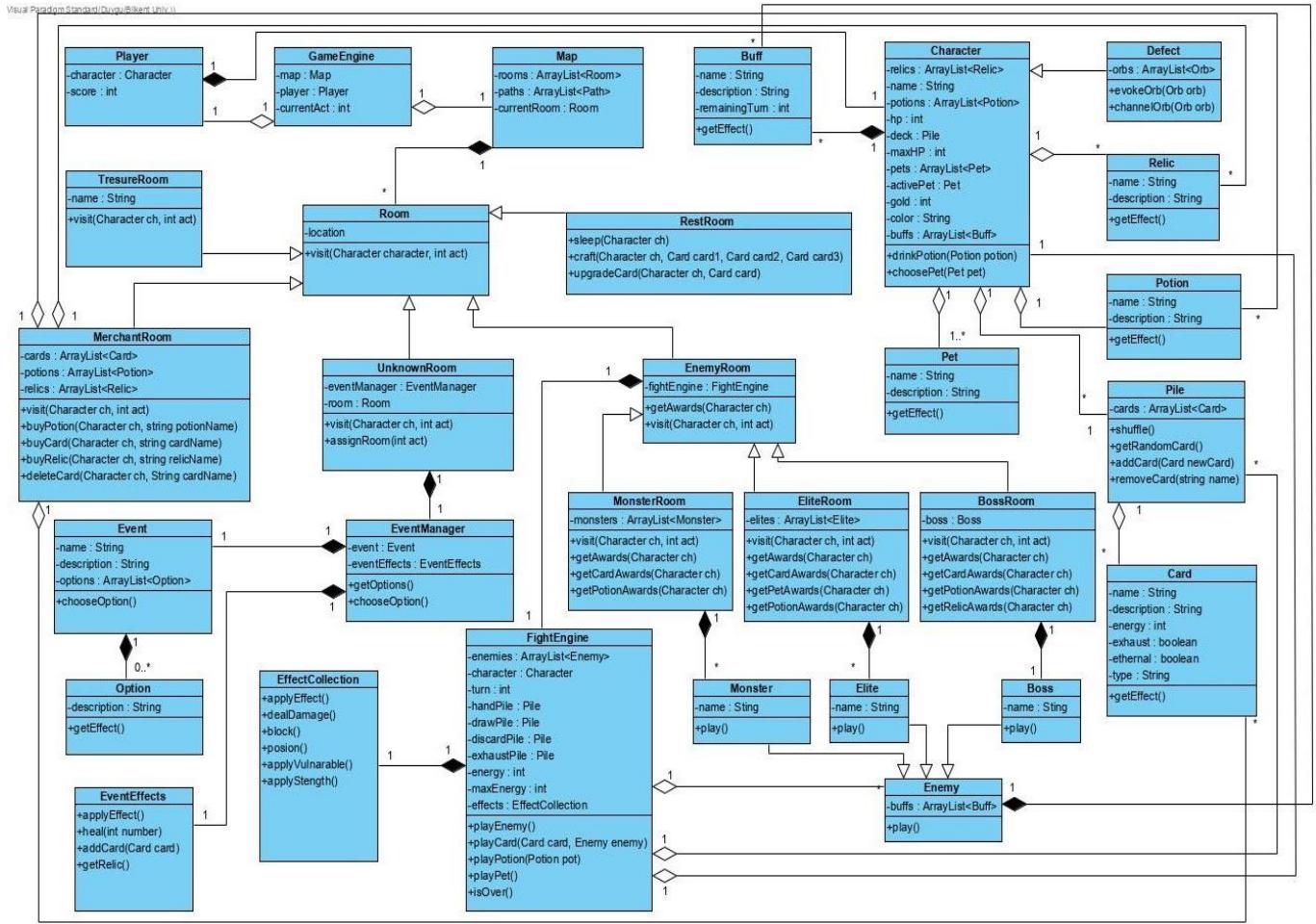
Use case name	ChooseTarget
Participating actors	Initiated by Player
Flow of events	The player selects a target for card to be applied on
Entry condition	The player selected the card
Exit conditions	The player selected the target or canceled the action.

Use case name	SeeDescription
Participating actors	Initiated by Player
Flow of events	<ol style="list-style-type: none"> 1. The user invokes the "SeeDescription" use case 2. Description of the object is displayed.
Entry condition	The player is in the fighting room
Exit condition	The player cancels the action.

Use case name	SeeContents
Participating actors	Initiated by Player
Flow of events	<p>1. The player invokes the “SeeContents” use case.</p> <p>2. Screen zooms in to the object and the contents of that object are displayed.</p>
Entry condition	Player invokes “SeeContents” use case
Exit conditions	Player returns to the fighting room.

Use case name	UsePotion
Participating actors	Initiated by Player
Flow of events	<p>1. The player invokes the “UsePotion” use case.</p> <p>2. The player either drinks the potion and effects of the potions are applied, discards the potion or cancels the action.</p>
Entry condition	The player selects the desired potion.
Exit conditions	Player cancels the action or uses the potion.

3.4.2. Object and Class Model



3.4.3. Dynamic Models

3.4.3.1. Sequence Diagram

We add 3 sequence diagrams for the Fight Room use case. Fig. 10 shows sequence diagram of playing a card including both attack and defense card. Fig. 11 shows enemy attack and pet attack sequence diagram, after the player ends its playing card turn. Fig. 12 shows drinking potion sequence diagram.

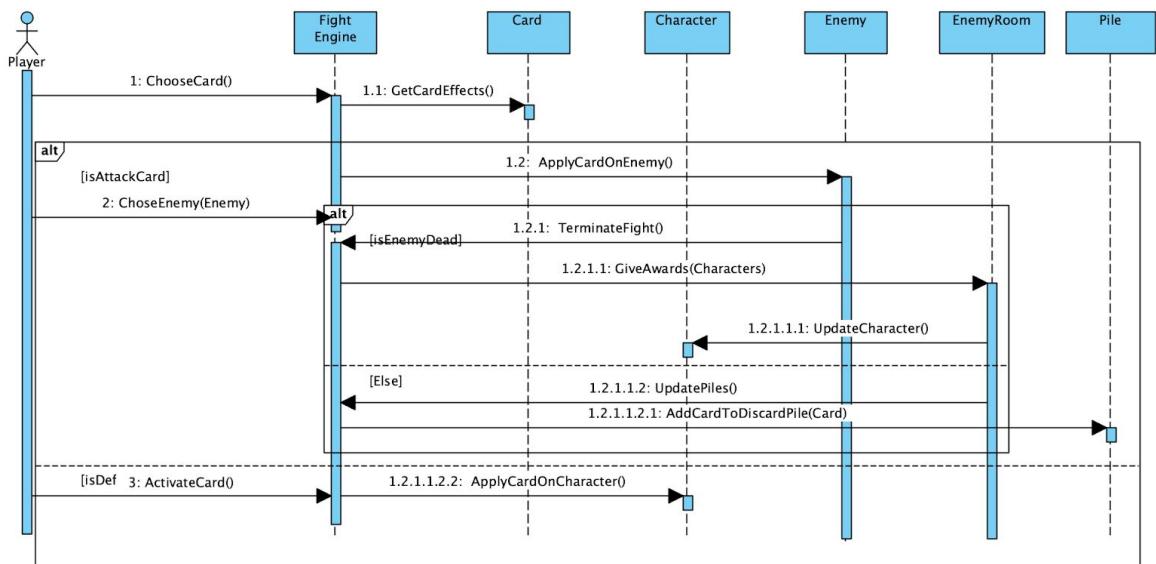


Figure 10: Sequence Diagram of Playing a Card

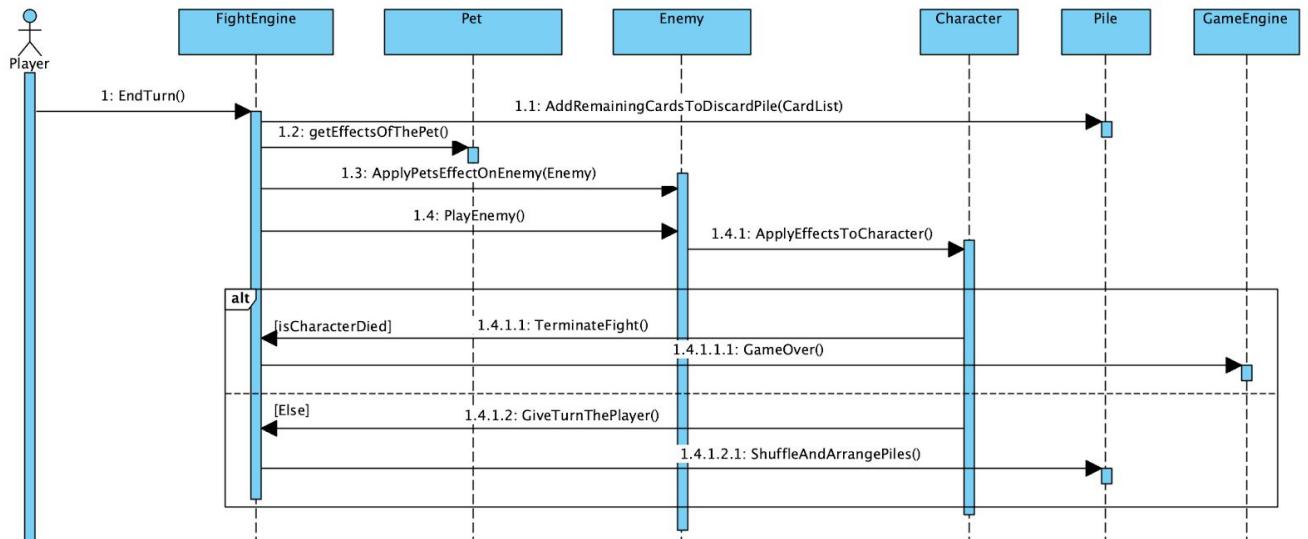


Figure 11: Sequence Diagram of Enemy Attack

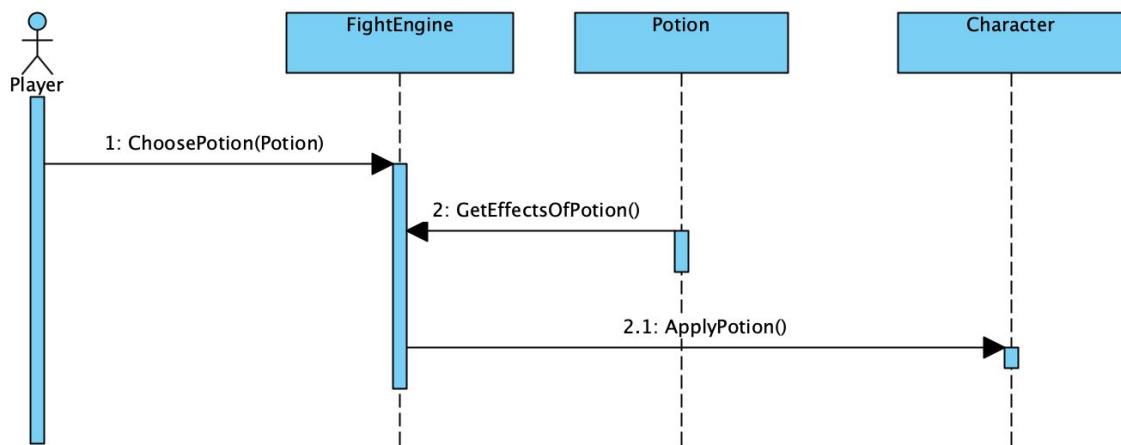


Figure 12: Sequence Diagram of Potion Drink

3.4.3.2. State Diagram

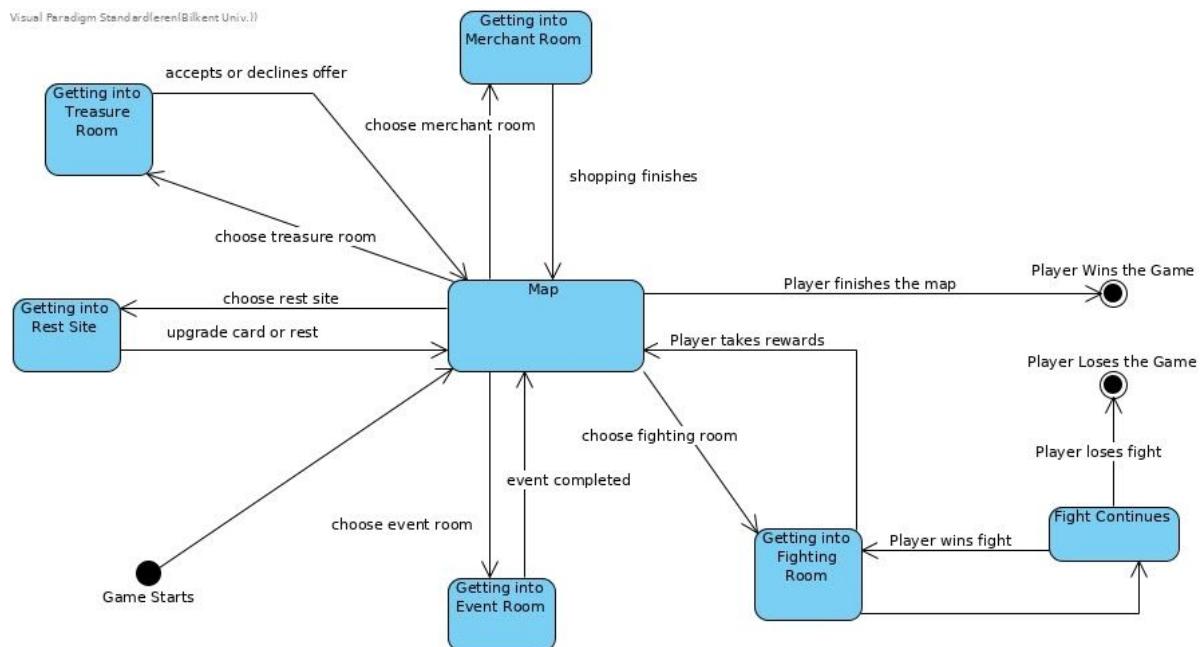


Figure 13: State Diagram Of The Game

3.4.3.3. Activity Diagram

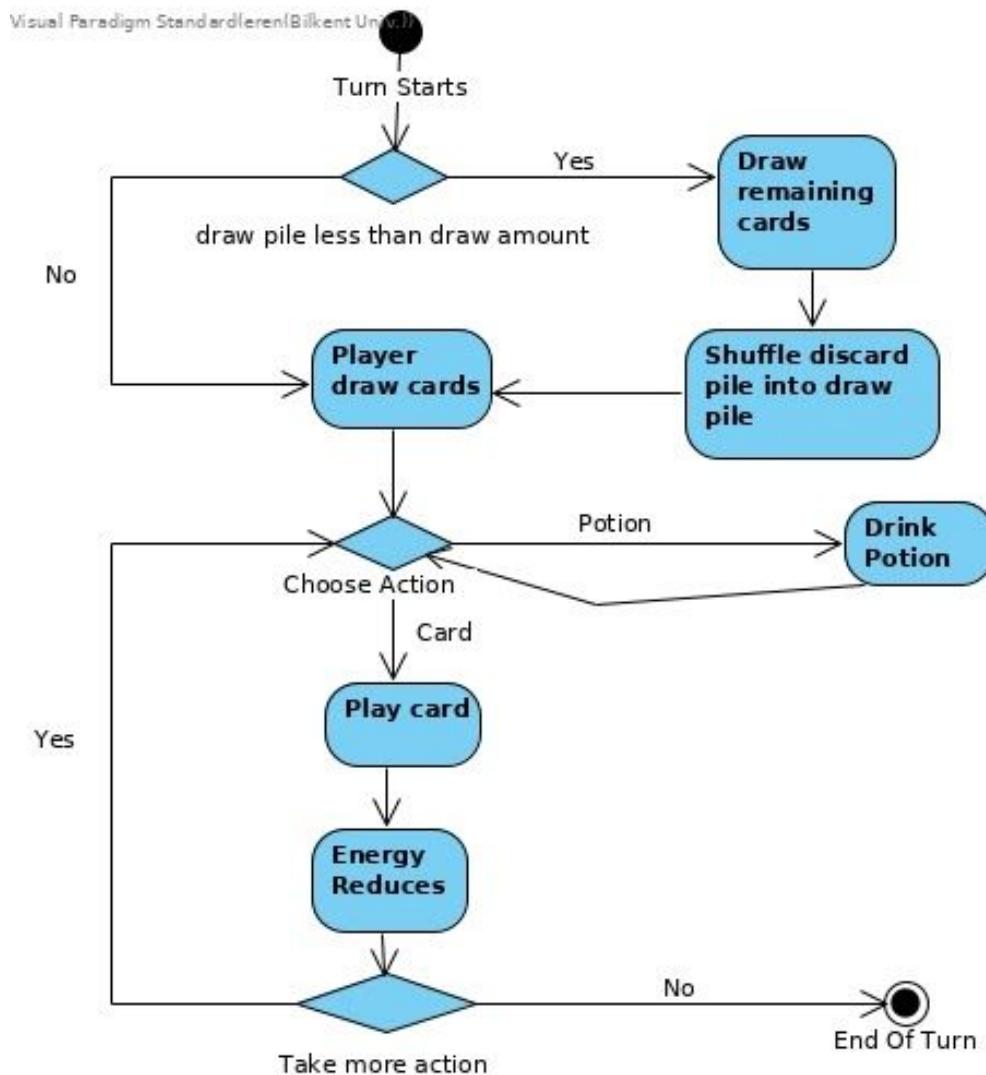


Figure 14: Activity Diagram Of A Turn

3.4.4. User Interface

3.4.4.1. Main Menu

When the game is opened first, main menu shows up. In this screen the user can choose the following options: Play, Compendium, Statistics, Settings, and Quit. Also, by clicking the button under the user name, the user can change saved player as shown in Fig. 15.

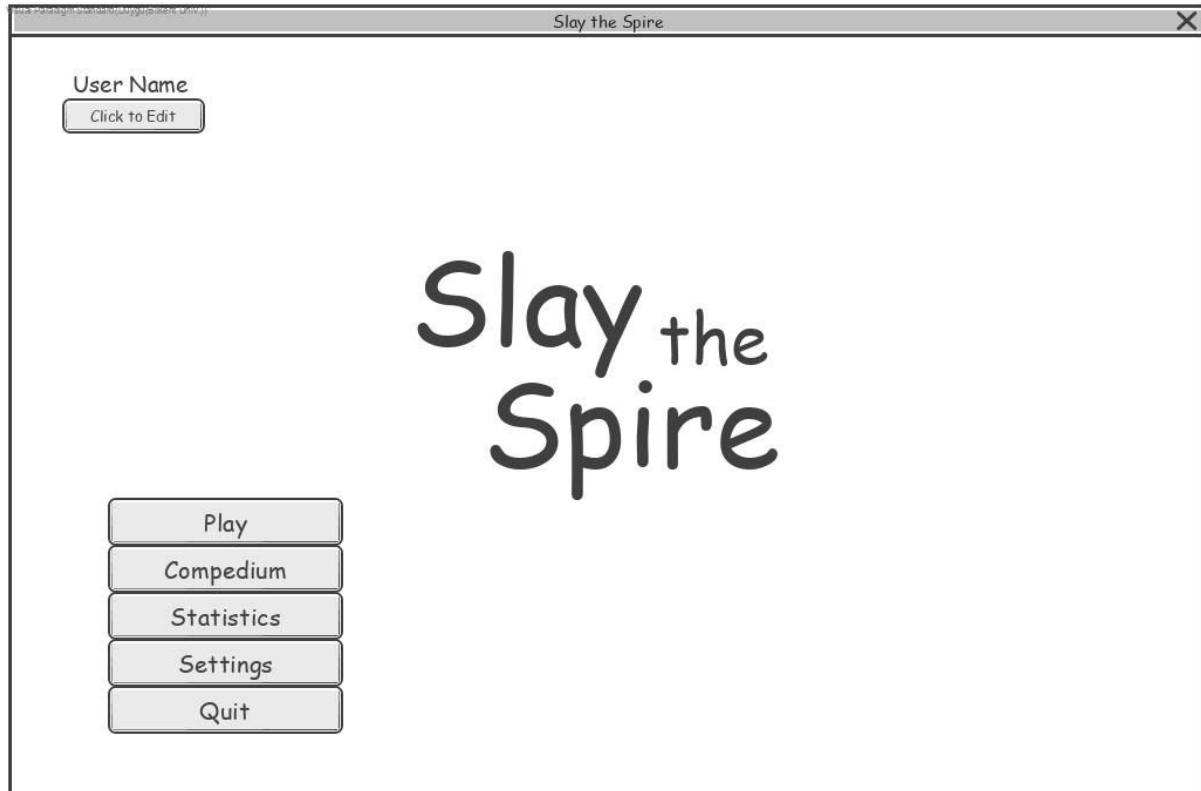


Figure 15: Main Menu

3.4.4.2. Choose/Add Player

When the player clicks the edit button under the username in main menu, the page shown in Fig. 16 pops. There are 3 slots of players. Saved players can be activated, renamed or deleted. If there is an empty slot, the user can add a new player as shown in Fig. 17.

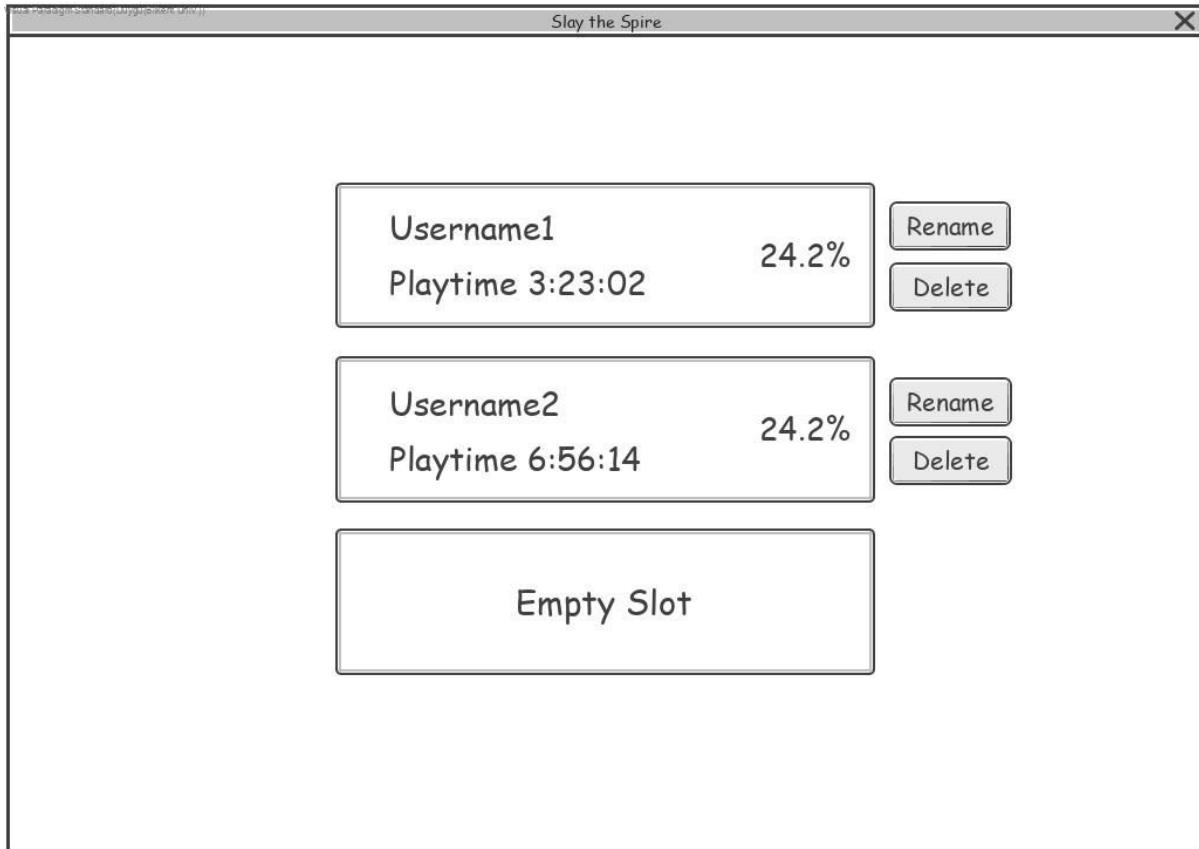


Figure 16: Player List

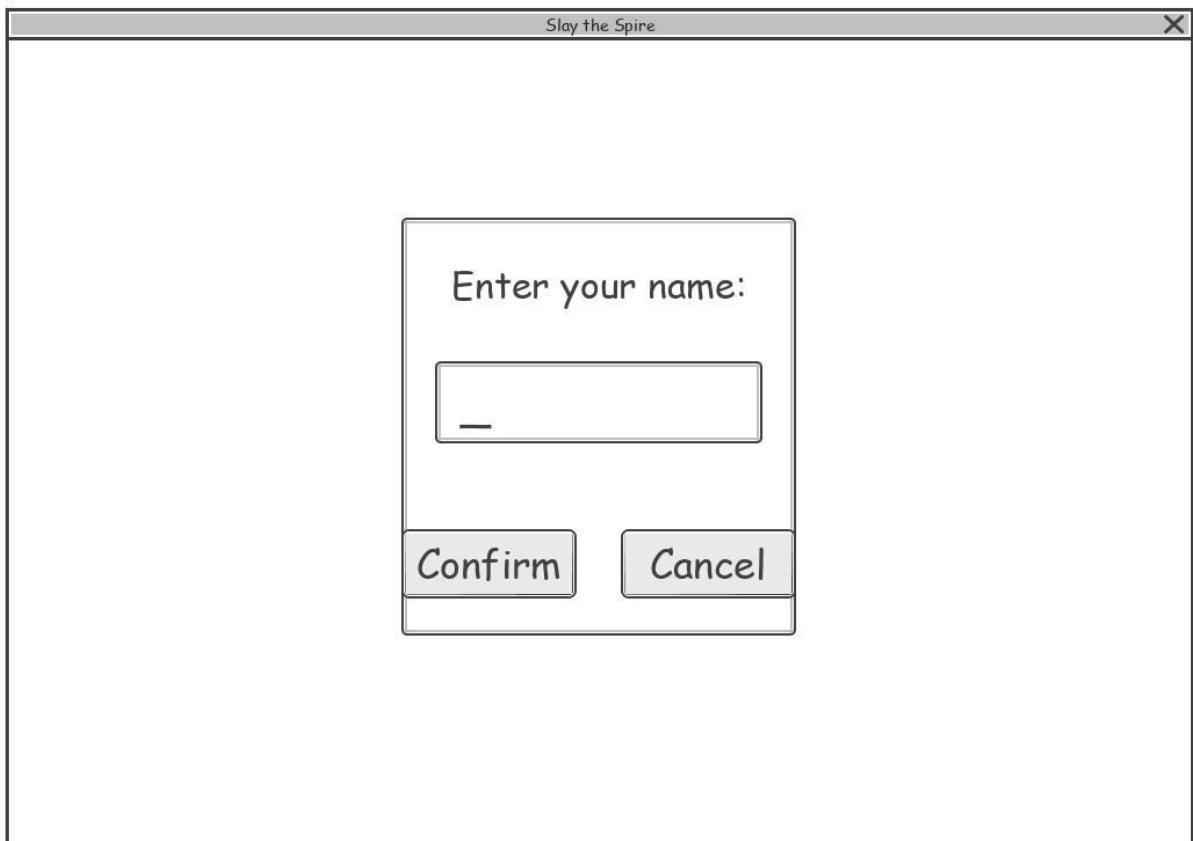


Figure 17: Add New Player

3.4.4.3. Play

3.4.4.3.1. Game Mode

When the player chooses the “Play” option in the main menu, choosing game mode page shows up immediately as shown in Fig. 18.

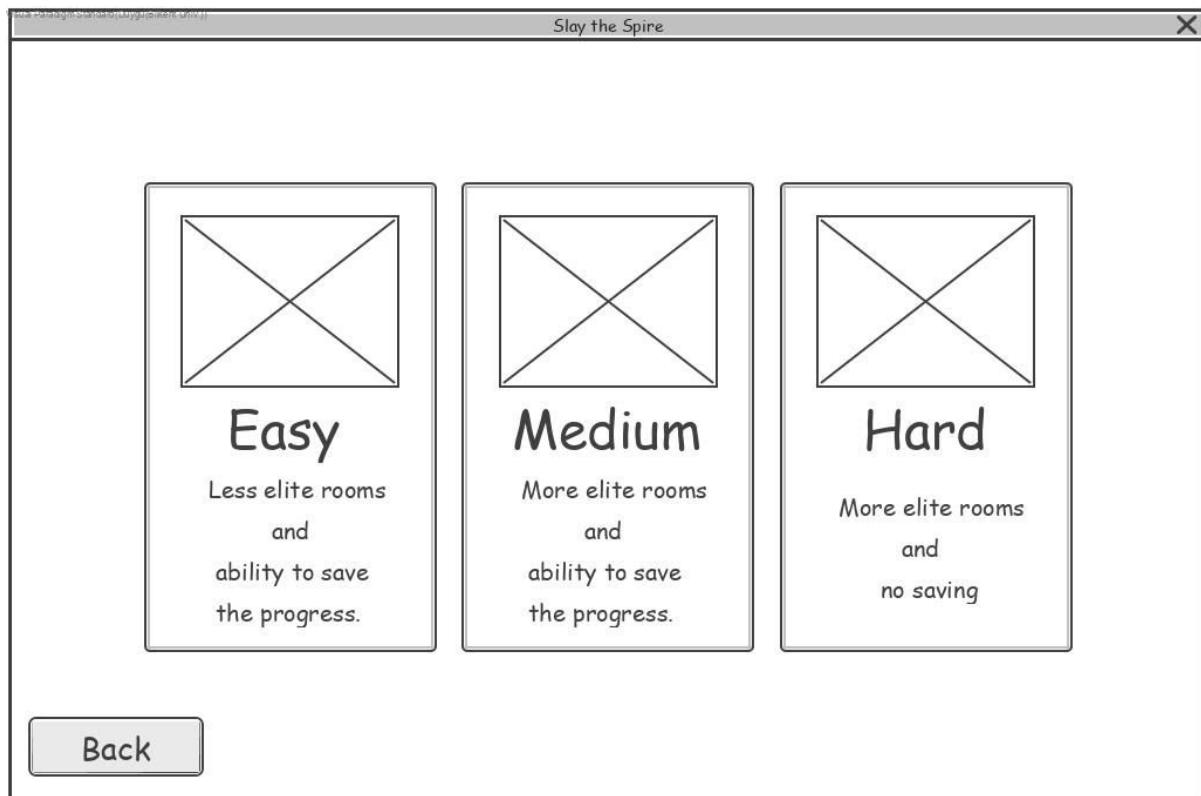


Figure 18: Game Mode

3.4.4.3.2. Choose Character

After choosing the game mode, the player has to choose the character to play. Picking a character page is shown in Fig. 19.

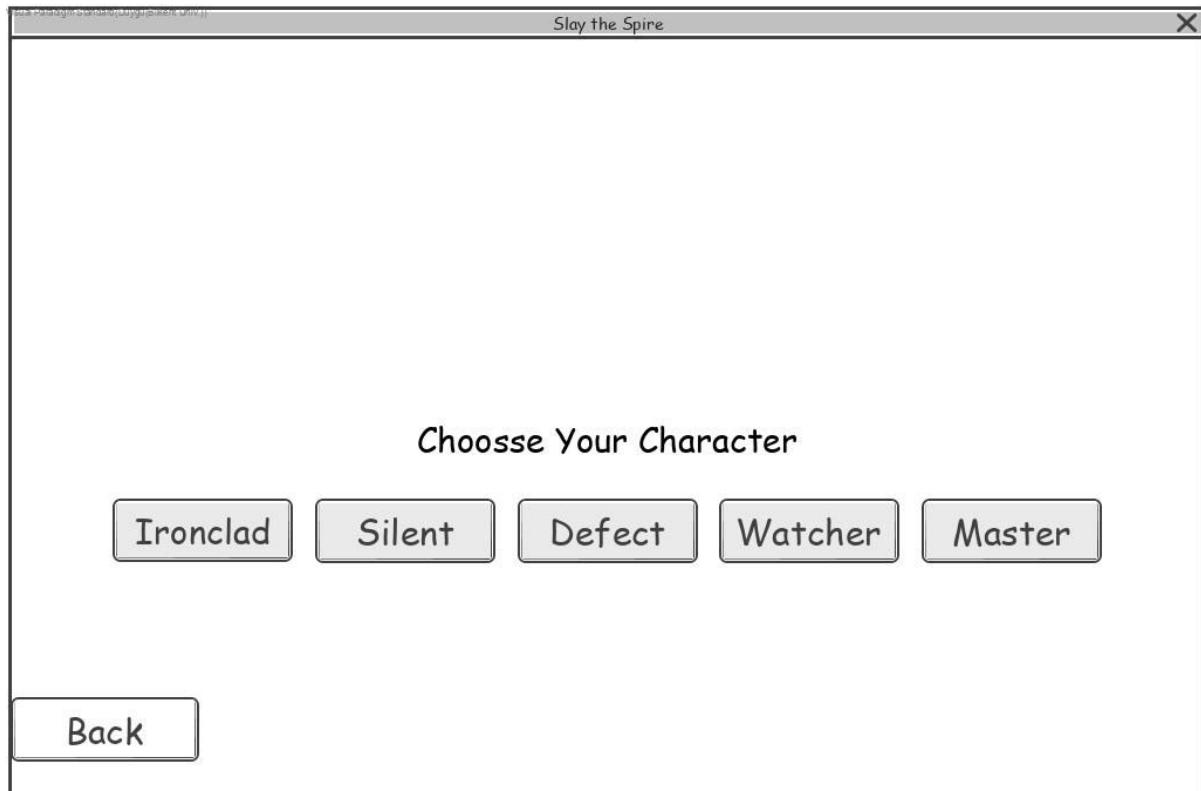


Figure 19: Choose Character

3.4.4.4. Map

Map is shown in Fig. 20. Choosing pet is done in the map scene. Right bottom of the screen is for pet slots. The player chooses the desired pet before the fight.

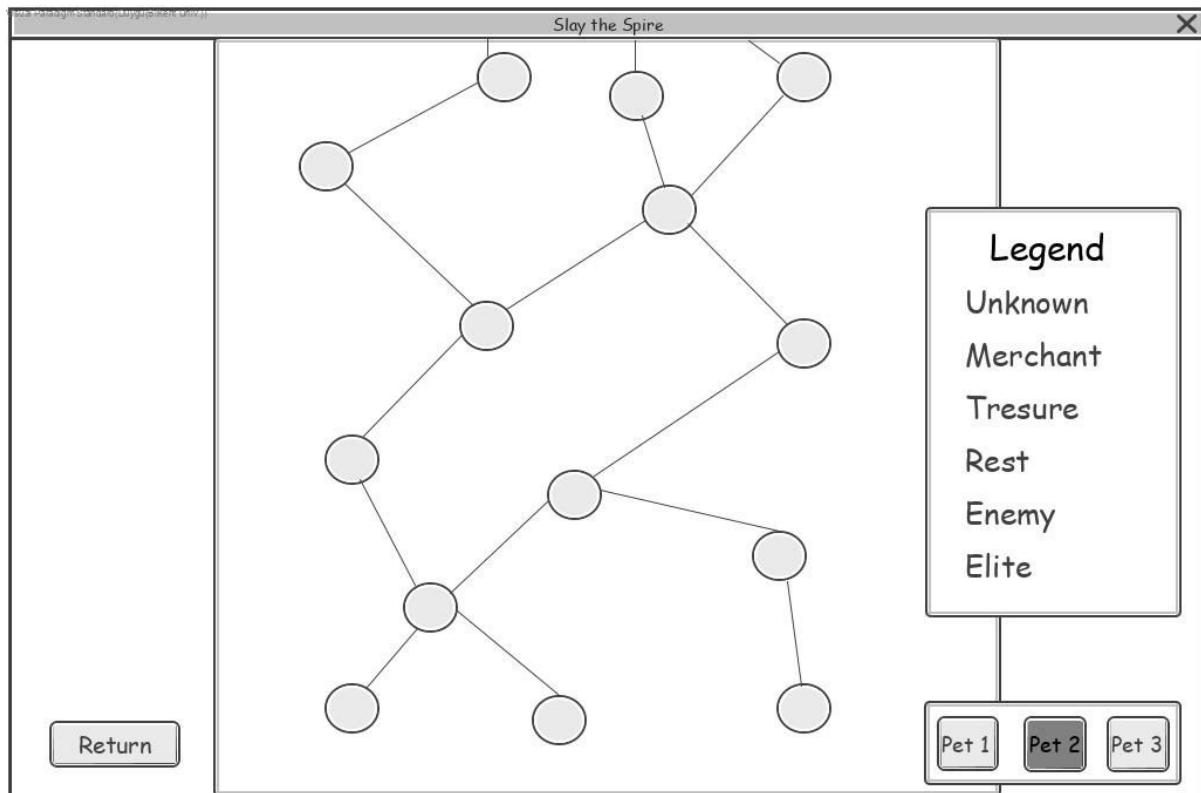


Figure 20: Map

3.4.4.5. Fight

Fight scene is shown in Fig. 21.

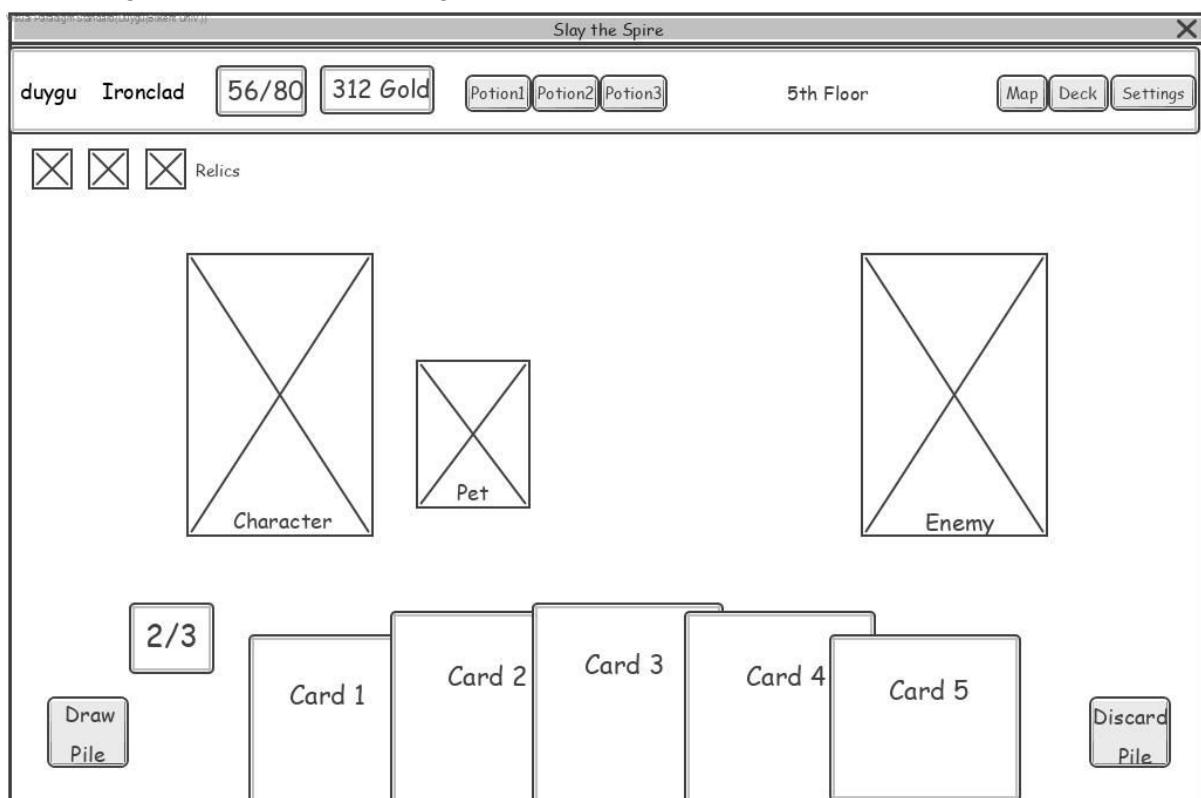


Figure 21: Fight Scene

3.4.4.6. Rewards

After each fight, the player gains some rewards. An example page of rewards is shown in Fig. 22. Treasure room has also a similar interface, only caption is “Treasure!” instead of “Rewards”.

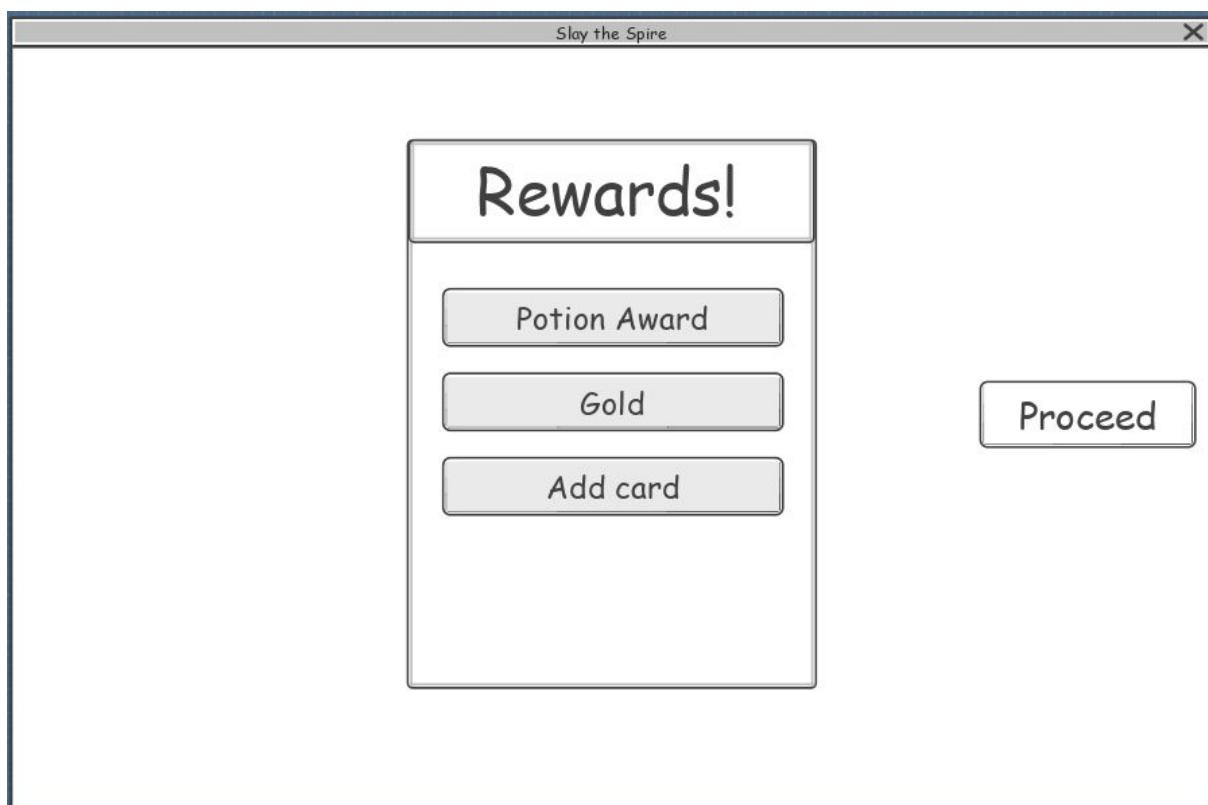


Figure 22: Rewards

3.4.4.7. Rest Site

When the player enters a rest site there is 3 option to choose. By clicking the buttons, the player goes to related screen. The user interface of the rest site is shown in Fig. 23.

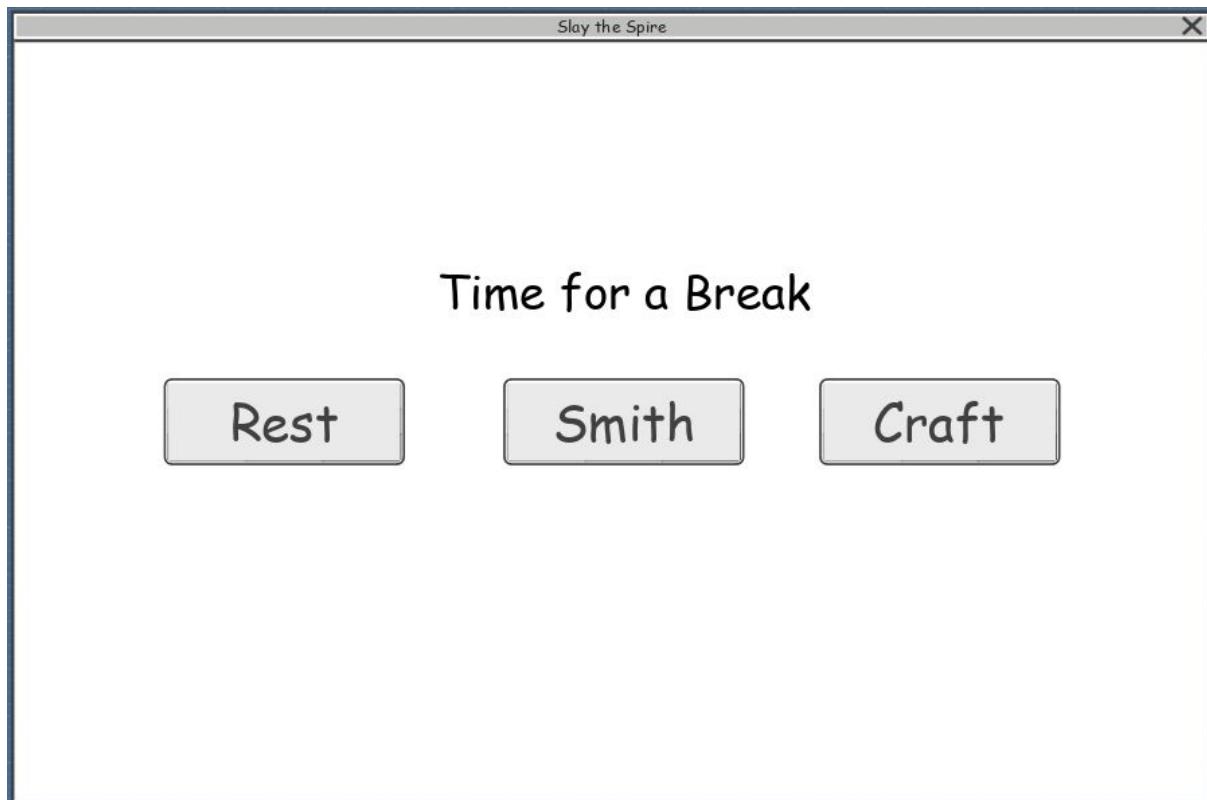


Figure 23: Rest Site

3.4.4.8. Event Room

An example of an event is shown in Fig. 24.

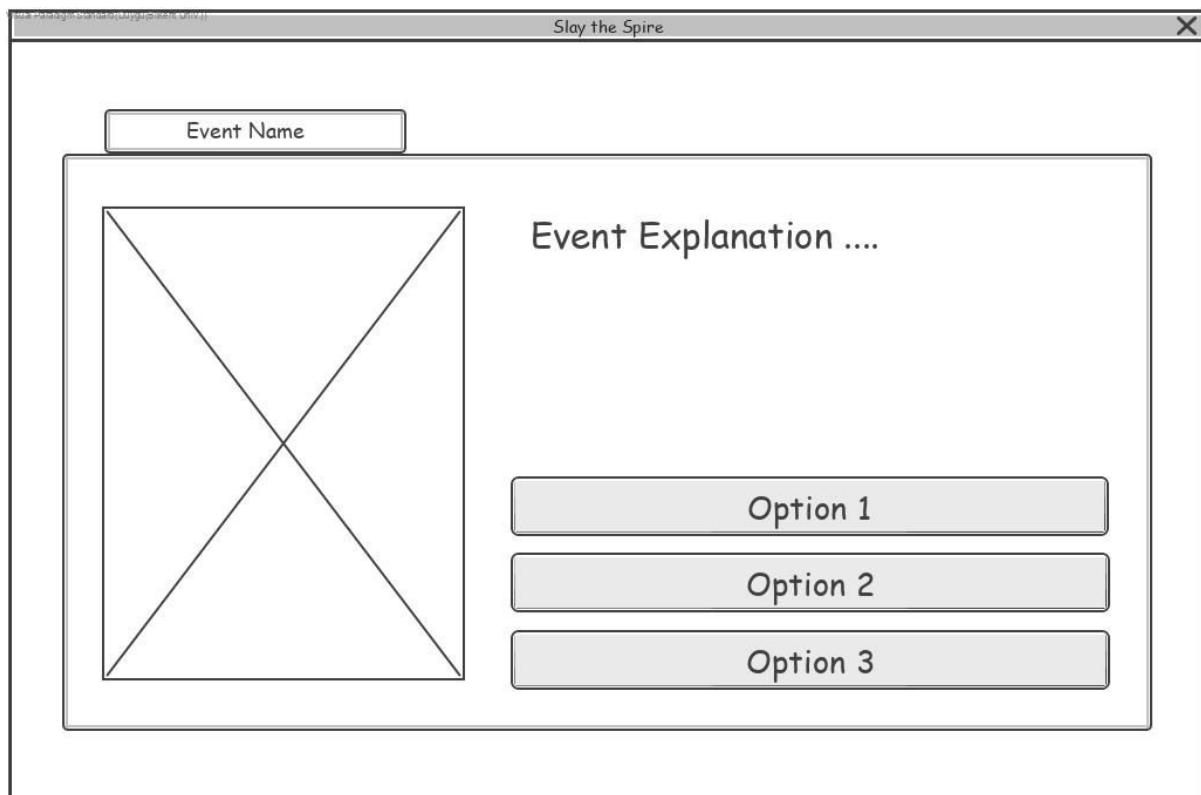


Figure 24: Event

4. References

- *Slay the Spire Wiki*, Fandom, viewed 10 March 2020,
<https://slay-the-spire.fandom.com/wiki/Slay_the_Spire_Wiki>.