

# Final Project Design

## Team 4

### Members

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### Project Name

ESCAPE

### Project Synopsis

A pixel 2D entertaining roguelike game is aiming to present the negative impact of failed education from parents on people.

### Project Description

- The reason why the project is being undertaken?

All members of our team are like to play video games, so we want to develop a game. In addition, we hope this game be educational so that people who play this game not only have fun with it but also learn something from it. Because of this reason, we decide to make a game that can gradually show a meaningful story to players through the form of entertainment.

- An opportunity or problem that the project is to address.

For a team without game development experience, how to cooperate well and how to accomplish the goal together is the hardest part. First, every team member needs to be familiar with the compiled language (C#) and learn to use Unity 2D alone, which will reduce the communication between teams, and lacked the initial game design planning. A successful game development team is often planned, and some team members will complete the framework to make the cooperation between team members easy. These are not available in our team, but at the same time, they are also opportunities for the team to learn these insufficient skills.

- The end result of the project?

The end result of the project is a 2D roguelike game. Players can operate the protagonist to experience, pass the levels after defeating the monsters, then randomly go to a map that hasn't been to, and finally defeat the boss to win. In the process of fighting, the player can find the hidden secret about the protagonist.

### Project Milestones

<u>First Semester:</u>	<u>Due Date:</u>
● Front-end and Back-end diagrams completed	(10/08)
● Game structure design	(10/20)
● Game storyline written	(11/08)
● Preparing game source and begin coding	(12/17)

## Second Semester:

Due Date:

- Completing the first draft of ESCAPE (02/28)
- Game testing and bug fixing (03/16)
- Improving game and adding sound (03/31)
- Final Testing and Completing game (04/11)

## Gantt Chart



## **Project Budget**

- Hardware, software, and/or computing resources
  - Unity 2021.2.7f1 LTS (free) (Fall and Spring semester)
  - Unity assets (depending on the amount of time for asset development) (Fall and Spring semester)
- Graphics and assets development
  - Art, music, voice acting (Spring semester)
- Pluralsight Training Tools
- Estimated cost: \$400-800

## **Final Project Design**

ESCAPE will be a subgenre of role-playing video games characterized by a dungeon crawl through procedurally generated levels, the player can repeat play the game until they finished the game and the permanent death of the player character. During our research, we found several high-quality roguelike games on Steam and had much of a good rate in those games' feedback. At all, our game will correspond with video games and sample interactive storylines.

The software we created will be an application on Steam and may add controller adaptation to the PS platform or Xbox platform. The basic organization of the game is that when a player accesses the main menu, there are three buttons that the player can choose, which are "Start Game", "Setting", and "Help". First, when he chooses "Help" it will show the keyboard button that allows the player to play the game. Second, when he chooses "Setting", it will show the sound control and language change.

Right now, we don't allow you to change keyboard buttons, which may change in future updates. Finally, when the player chooses "Start Game", as Figure 1 presented, players will enter a random map and they need to find the exit door at each floor in order to climb up to a higher-level floor. If players die before meeting the boss in the fifth level, the interface of the game failure will be displayed and then the system will ask players if they want to continue the game. If not, players will go back to the main menu for quitting the game. If players would like to start again, they will go back to the main level floor (first level floor) play another random map and continue climbing up the floor. If he stays on the fifth floor and finishes all the enemy and finds the exit door, he will be against the final boss. If he wins that boss, he will trigger the final CG of this game, and successfully escape the room, and back to the main menu, if he loses that boss, he will trigger the lost CG and also back to the main menu. On each floor, players can find the skills and tools that increase character ability and get some medkit. Skills can increase such as a player's attack rate, and change his attack way, or speed up his speed, or increase his defense. Due to we don't design bag systems for the player, all the tools can only be used or left on the ground. Players can temporarily leave items on the ground and use them when they need, but the item will disappear if the player leaves the current floor. Those skills and tools can be gathered from enemies, treasure, and small bosses. Even if you are moving to a special spot, you will surprisingly gather skills and tools. In Figure 2, we can see that there are five types of floor and each floor will have distinct characteristics for the enemy and small boss.

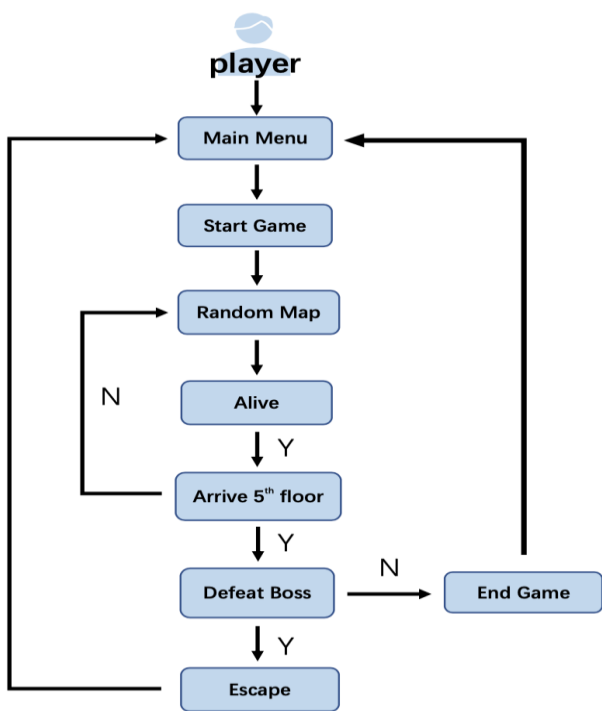


Figure 1. The Flow Chart of the Game

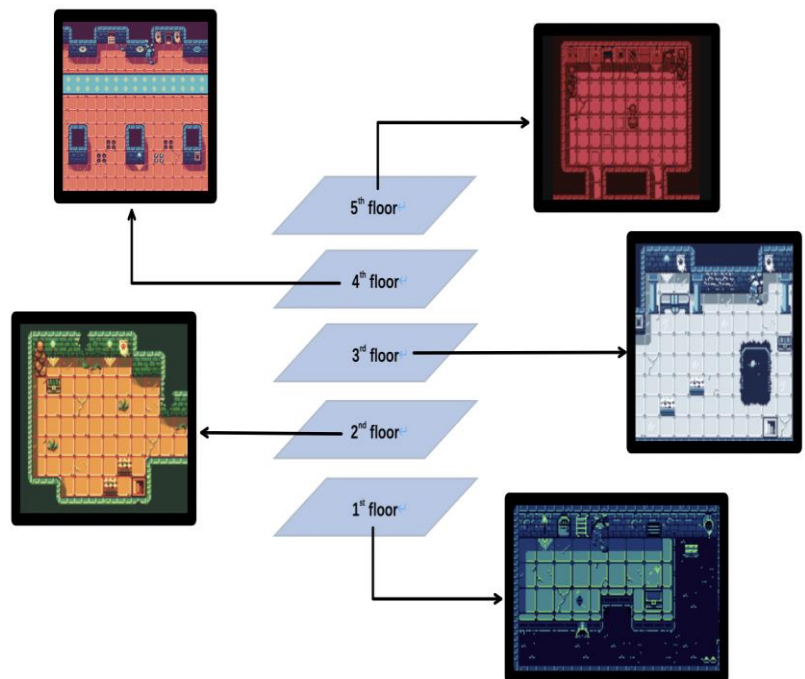


Figure 2. The Designed Map of the Game (The picture is not the final game screen, just to show the different map drawings)

Every time players defeat an enemy or boss, they can get coins, which can be used in the game to buy supplies, including blood items, magic items, and some buff items. These points can be inherited as well, which means that players will have the opportunity to obtain more advanced weapons or skills before entering the map so that it increases the opportunity of successfully

defeating the enemy and boss. Players need to have a plan to use their coins and supplies to maximize their gains and then escape successfully. We are also putting some bonus scenes in-game that players don't have to against the final boss but still can escape the room, we call it "God Escape", to trigger a special CG ending. In the process of playing, players have the opportunity to know our hidden secrets. It's random, so players have to try many times to know the truth of the game.

The design constraints in our team can be included in the technical and budget.

### Technical constraints:

Operating system supported, software and programming language:

Our team has no experience in game development, so the choice of language and compiler is a technical constraint. We finally decide to use Unity2D and C# as IDE, and the unified use of Unity is 2021.2.7f1LTS (free) version as a compilation. Additionally, the keyboard operation is required in our game design, and it must work on Windows, Linux, or macOS and cannot support on mobile platforms.

### Database:

Our team doesn't have an entire database to store data. Our data is stored separately in different scripts. The limitation is that it is difficult for our team members to query the data intuitively and cause trouble for subsequent expansion. it's fine for the current project, if we want to add more features or expand our game, we need to rebuild the database to make it more organized.

### Framework:

In the early stages of development, our team chose to use common open-source game frameworks to design our product but found that these frameworks are too bloated (most of these frameworks are suitable for 3D games, but our team develop a 2D game), which is not very adapt to our game design. As far as the design requirements of our 2D roguelike games are concerned, a lightweight game framework could reduce a lot of our work, and it is also convenient for post-production modifications. In Figure.3, it is the game architecture diagram we designed. This architecture can only be used to obtain the UI of all game pages, switch various scenes, control audio, obtain and modify all data, moving shot, and battle system. However, in this framework, there is no online feature. In other words, this game does not have in-game updates (If we have new features or story plot updates, we can only adapt by downloading the update package) and cannot design multiple players, which is a design constraint. The battle system needs (Figure.4) to meet the interactive functions between characters, and the specific implementation also requires some special requirements. We simplify the design of the

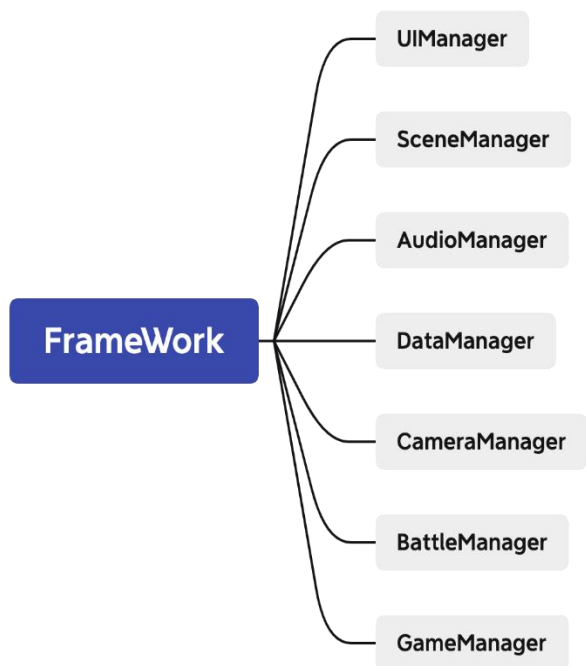


Figure 3. Game Architecture Diagram

combat framework into AI management, skill management, and event management. The entire game

framework cannot be used in Figure4. Battle Architecture Diagram outside of Unity because it is based on the Unity platform.

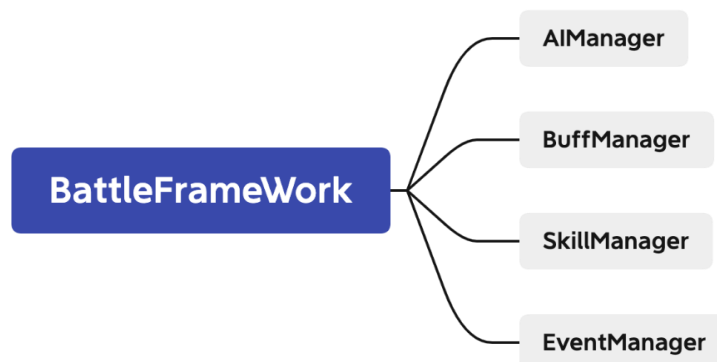


Figure 4. Battle Architecture Diagram

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#### Budget constraints:

Most game development requires art, music, and game dubbing support. Because of our budget, most of the design materials are free to use or simply made by ourselves. This game may not have exquisite art design and can only meet basic art needs.

### **Ethical Issues**

#### 1) Data privacy issue

When we do research and build games, we must consider the issue of protecting players' game data and personal privacy. We must proceed accurately and ask appropriate questions and permissions about privacy protection to protect each of our players' data. We will plan everything carefully so that there are no issues when getting feedback from the user's testers. In addition, if we conduct any formal real-time user testing, we will create a user testing agreement and a privacy confidential account so that users and game players can fully understand the privacy requirements related to participating in the game.

#### 2) Violence and bleeding scene issue

Another ethical issue is the problem of violence and blood on the mental health of young people. Due to the nature of our game, the main story in the game is about fighting monsters and escaping the map. We recommend young players and users participate in our game. And our game screen style is pixel style, which greatly reduces the visual effects of violence and blood so that our users can better experience the story of the game and enjoy the story of the game. We will determine the user and the age of the game player before starting the game, to avoid harming the mental health of young gamers.

### **Intellectual Property Issues**

In the process of making games, it is indispensable for us to collect a large amount of material, and there will inevitably be related problems related to intellectual property rights. To avoid the risk of infringing intellectual property rights as much as possible, we double-check the assets are free for commercial and personal uses to build our games. An intellectual property issue is that all art or

music we include in the game must be used fairly in our game. In addition, if we decide to charge for apps in the app store, then art and music must be used fairly in games for profit. And we will protect the game from unauthorized use after the game is completed.

## **Change Log**

- Changing in Milestone
  - Discussion for the game structure and storyline and preparing game material took a longer time than expected so we had to start coding in the winter break and try to finish the first draft at the end of February in the second semester.
- Changing in Game Designing
  - We changed the animation of the character from 4-direction to 2-direction, so that it can better fit the design of the weapon.
- Changing in software
  - Unity version changed from 2019.4.10f1 LTS to 2021.2.7f1 LTS. The newest version fixed the problem that occurred after deleting atlases outside Unity Editor.