

Web Based Escape Room Game “La Cosa Nostra” Using WebGL

Yoseph Richardo¹⁾, Darius Andana Haris^{2*)}, Jeanny Pragantha³⁾
Computer Science Department, Faculty of Information Technology
Tarumanagara University

¹⁾yoseph12richardo@gmail.com, ²⁾dariush@fti.untar.ac.id, ³⁾jeannyp@fti.untar.ac.id
Corresponding email: dariush@fti.untar.ac.id

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Abstract.

"La Cosa Nostra" is a two-dimensional website-based escape room game that can be accessed using internet browser. This game was developed with Unity Game Engine. The player will play as a detective investigating the case of a missing woman. Testing methods was done by Blackbox testing, Alpha testing by lecturer and Beta Testing will be using survey form.

1. INTRODUCTION

The development of the gaming industry recently has increased rapidly. There are a lot of different genres of the game available in the market with varied gameplay too [1]. One of such is the escape room genre which is a subgenre of point-and-click adventure game that requires the player to get out of a locked room utilizing their surroundings.[2]

Story-telling is an inseparable part of human culture. The appreciation of a good story is a gift not granted to any other species of the planet, except for humans[3]. There are a lot of media that can be used to tell a story such as orally, through a performance on the stage, in a film, or in written form. Since the development of the gaming industry, a game by itself can be used as a medium to tell a story.

The game that will be developed is titled "La Cosa Nostra". In this game, the player will act as a detective investigating the case of a missing woman unknowingly involved in a much bigger case than he expected. The game was developed using C# programming language on Unity Game Engine. By using Unity Game Engine, the finished game can be easily exported into a WebGL file.

2. METHODOLOGY

2.1. Game Design

A design method is needed in order to create a game to act as a guide in the development process.

There are several things that must be considered, namely as follows:[4]

1. High Concept

High Concept is a short description of the game. The game "La Cosa Nostra" is a website-based two-dimensional escape room game. The language used is English.

2. Gameplay

Gameplay describes what can be done in the game and how to do it. The player will have to navigate around the room to collect object and solve puzzles in order to open a door to another room. The process of preparing the gameplay is as follows:

a. Control Design

This stage is the phase which aims to determine what devices are used for control of the game. The game "La Cosa Nostra" is played using a mouse or by touching the screen in mobile devices.

b. Object Design

Object design describes the function of the objects in the game. The objects used in this game are items that can be picked up by the player such as a key, an access card, etc; interactive objects such as paper clues; and some puzzles to solve.

c. Level Design

The level design describes the design of the levels that must be completed by the player in the game. The game "La Cosa Nostra" has 4 levels with no increasing difficulty but indicates a change of rooms.

d. Sound Design

Sound design describes the sound that plays during the game such as background music and sound effects. One example of the background music used in this game is Chill Lofi Epiano Loop 80 BPM by holizna. Sound effects used in this game are bell sound, door opening sound, the sound of a brush, etc.

3. Audience

This stage of the development specifies the target players of the game. The target players of this game are all people over 16 years of age.

4. Hardware and software

This part describes the minimum specifications of the hardware software used to play the game. Because this game can be played using internet browser, the specifications of the hardware and software of the device are irrelevant. The software used during the development process was Unity 2019.4.10f1, Visual Studio Code, and Adobe Photoshop 2020.

5. Interface Design

The interface design includes a description of the user interface (UI) of the game like initial display, menu display, and game display.

2.2. *Game Genre*

Every game has a gameplay category or genre that classifies games so that each genre has its own advantages[5]. The game "La Cosa Nostra" is categorized as an escape room game. In the game, the player has to advance through all of the rooms while solving puzzles to escape.

2.3 *WebGL*

WebGL (Web Graphics Library) is an API used to render 2D or even 3D graphics on a web browser without any plug-ins. WebGL runs on HTML5 canvas element[6]. WebGL can be used in any compatible browser and on any devices. The finished game will later be exported into WebGL format so it can be played on any device through the web browser.

3. **Testing and Discussion**

The testing phase is the stage that is carried out after the game development has been completed. Testing phase aims to ensure that the finished game corresponds with the initial design and to test whether the game has any error or not.

3.1. *Blackbox Testing*

Blackbox Testing is done by running each of the existing modules of the game that has been made to find errors or bugs and ensure that all the functions contained can run smoothly. The display appearance of all modules in "La Cosa Nostra" can be seen in Figure 1.

3.2. *Alpha Testing*

Alpha Testing is done by people who have experience and knowledge about information technology and game development. Alpha Testing on the game "La Cosa Nostra" was carried out by two advisor who understood the concept and purpose of this game. There are several changes in the game, which are the following:

1. Added a typewriter sound effect on the prologue.
2. Added a text "Or is it" at the epilogue.
3. Made the prologue more interesting.

All of the changes mentioned above have been applied to the game.

3.3 Beta Testing

Beta testing was done by 32 respondents playing the game from June 13 to June 15, 2022. After playing the game, respondents were asked to fill out a questionnaire which consists of 23 questions.

3.4 Discussion of Results

After the Beta Testing period ended, the questionnaire results were analysed. The following are the analysis results:

1. There are 20 respondents (62.5%) who have played an escape room game before.
2. There are 15 respondents (46.9%) who played using mobile smartphone, while the rest played using laptop/computer.
3. There are 13 respondents (40.6%) who played using Android device, 2 respondents (6.3%) who used iOS, 15 respondents (46.9%) who used Windows device, and 2 (6.3%) respondents who used macOS.
4. Chrome becomes the most used browser to play this game. There are 24 respondents (75%) who used Chrome to play. There are 2 respondents (6.3%) each who used Firefox and Microsoft Edge, and 1 respondent (3.1%) each who used Safari, Opera GX, Mobile Apps, and through Line.
5. As much as 27 respondents (84.4%) didn't encounter any issue while playing, while the rest were having issues such as inconvenience caused by the small button on mobile device.
6. As much as 5 respondents (15.6%) felt neutral towards the navigation system. There are 18 respondents (56.3%) that felt comfortable, and the rest felt very comfortable.
7. A total of 29 respondents (90.6%) who felt the placement of the control button already suitable. While the rest don't.
8. There are 23 respondents (71.9%) who finished this game to the very end. While the rest don't.
9. Out of 23 respondents who finished the game, 10 (43.48%) were able to finish the game in under 20 minutes, 6 (26.09%) were finished between 20-30 minutes, 6 (26.09%) between 30-45 minutes, and 1 (3.13%) over 45 minutes.
10. There are 9 (28.1%) respondents who felt very satisfied with the storyline of the game, and 14 (43.8%) respondents who felt satisfied. There are 6 (18.8%) respondents who felt neutral and 3 (9.4%) who felt less satisfied.

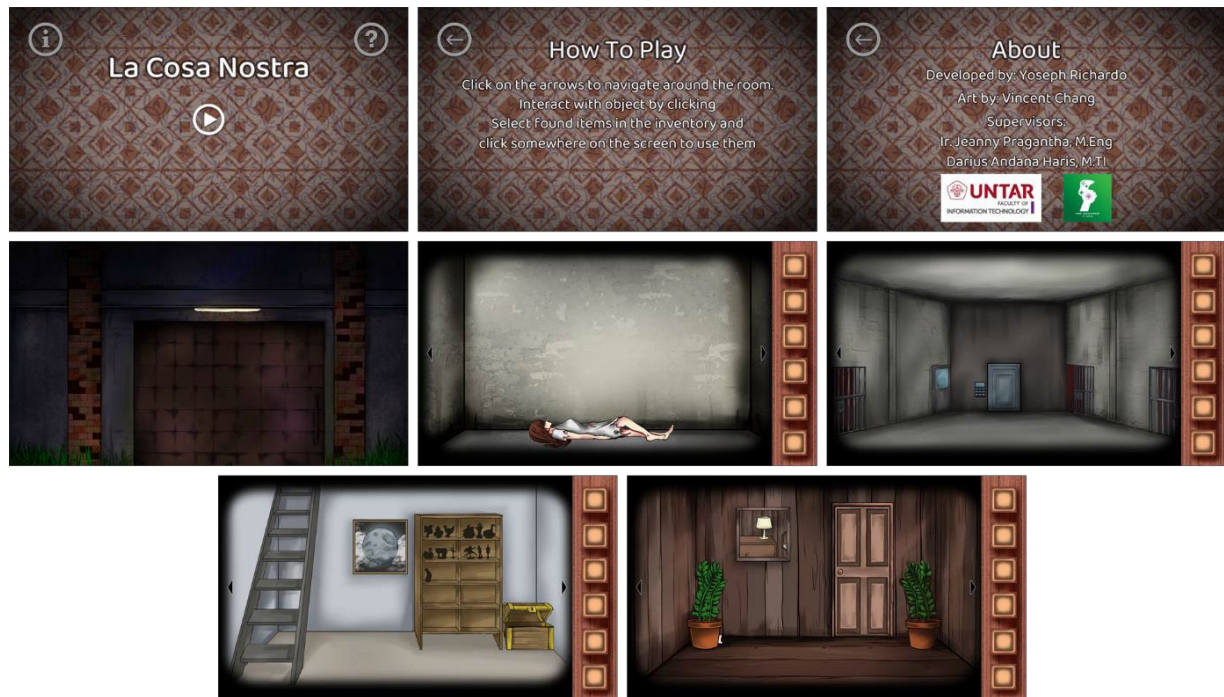


Figure 1 In-Game Modules

4. Conclusion

After the testing of the game "La Cosa Nostra" has been completed, the conclusions that can be drawn from the test results are as follows:

1. La Cosa Nostra can be played using various internet browser on computer or mobile devices.
2. La Cosa Nostra has already fulfilled its purpose as a medium to tell a story.
3. It takes less than 20 minutes to complete the game.

5. References

- [1] Pratama, Wahyu. *Game Adventure Misteri Kotak Pandora*. Purwokerto: Jurnal Telematika, Vol. 7 No.2., 2014
- [2] divisionten. *Escape-the-Room Games: A History, A Catalogue, and an Explanation*. Accessed August 16 2021, from http://www.theotaku.com/worlds/kinodiaries/view/122787/escape-the-room_games%3A_a_history,_a_catalogue,_and_an_explanation/, 2009.
- [3] Sheldon, Lee. *Character Development and Storytelling*. Boston: Thomson Course Technology, 2004.
- [4] Schell, Jesse. *The Art of Game Design: A Book of Lenses*. Boca Raton: CRC Press, 2020.
- [5] S, Ahmad. *Game Edukasi Cepat Tepat Dengan Metode Finite State Machine Pada Telepon Cerdas/ Smartphone*. Malang: UIN Malang, 2016.
- [6] MDN. *WebGL: 2D and 3D graphics for the web*. Accessed August 16 2021, from https://developer.mozilla.org/en-US/docs/Web/API/WebGL_API.