

Development of Platformer Endless Running Game “Endless Jetride” on Android

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Abstract. In this game player act as an astronout who has to run as far as possible and avoid monsters. This game is developed for Android based smartphone. This game was made using the Unity game engine with C# as the programming language. This game is endless with increasing difficulty as the player run further. The goal is to get the highest score as possible. Players must avoid obstacles by jumping. The player must use his or her voice to control the character. Testing is done by the blackbox method, alpha testing, and beta testing. The test results showing that "Endless Jetride" is a game that is not too hard and fun with interesting controls. Some players feel interested in playing, but there are deficiencies on the other hand, namely the lack of variations in object challenges, a pretty difficult obstacles for players who are not used to it.

1. Introduction

Game is a program that is designed in such a way as to meet one of the human needs, that is entertainment. Entertainment is considered important for someone because with entertainment people will freshen up their minds after being tired of doing some activities. [1]

Platformer genre game is a video game genre that focuses on passing through obstacles in the game. In a platformer, a player-controlled character must jump and climb between platforms while avoiding obstacles. The environment often displays uneven terrain with varying heights that must be passed. Platformer has many sub-genres for example, Puzzle-platform games, Cinematic platform games, Platform-Adventure games, Run-and-gun platform Games and Endless running games. [2]

The design that was ever made was Run 'N Escape, designed by Novaldo Rustandi. In this game, players try to escape as far as possible while freeing other captives. [3] The design can be seen in **Figure 1**.

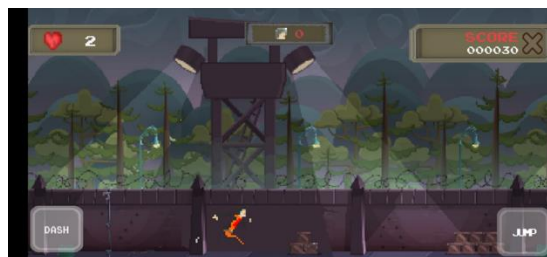


Figure 1 Run'N Escape

2. Theoretical Basis and Method

2.1. Game Designing

In making a game, it requires some steps so the game can be made as desired. The steps in making a game are divided into: [4]

1. High Concept

This step is about describing the details on the game. High concept aim to provide direction in determining what kind of game that has to be made.

2. Genre

The word "genre" comes from French which means type. Each game is certainly different from one another and into a certain category. Game genre categorizes a game based on game interactions. Endless running games generally have a linear 2D design with endless level. The game will start slow and easy. As the player getting further, the pace of the game will go faster. The faster player runs, the faster obstacle move. So that the player needs focus and react faster. "Endless Jetride" game is included in the Platformer Running Game genre. [5], [6]

3. Gameplay

This step explains the features and rules in the game. The gameplay preparation stage is divided into the following stages:

a. Control Design

Control design is describing about tools and ways to control things that are contained in the game. The control in this game uses voice from the player.

b. Character Design

Character design is needed to determine the ability of each character in the game. Character design in this game include player characters, and enemy characters.

c. Object Design

At this step, the objects in the game are made in such a way that each object created will be included in the level design. This game has obstacle objects and collectable objects.

d. Sound Design

This stage is the step of making sounds that will be used in the game. Sounds are an important aspect that must be included in a game so that the game become more interesting.

4. Audience

Audience is the target of this game, the one who will play this game. The target of the game is usually determined by the contents of the game, so there are limits for who the game can be played. The target users of this game are people over eight years old and can use basic English.

5. Hardware Platform

The hardware platform explains the minimum specifications of the hardware and also the software needed to play the game.

6. Interface Design

Every game needs an appearance. Layout design contains assets, initial layout, main menu and in-game layout. Layout helps the player to interact with the game.

7. Testing

After the game is finished, it is necessary to do the testing phase to see whether the final result is in accordance with the concept and whether there are still things that need to be repaired or found errors in the game. The testing phase is divided into Alpha Testing and Beta Testing.

3. Testing and Results

After completing the designing steps, the testing phase of the game "Endless Jetride" is conducted. Testing is done in order to find out the game runs well. "Endless Jetride" was tested by using 3 testing methods, Blackbox Testing, Alpha Testing, and Beta Testing.

3.1. Blackbox Testing

Blackbox testing is done to check the menus in this game. Following are the menus tested:

1. Main Menu Testing

This menu is the beginning of the game layout. Main Menu layout can be seen on **Figure 2**.

2. Main character testing

Test is done to ensure every movement of the main character goes well with no errors. When the player using a loud voice, the character will jump. If the player using a small voice the character will run and if the player is silent then the character will walk. Main character can be seen on **Figure 3**.



Figure 2. Main Menu



Figure 3. In-game interface with main character

3. Pause menu testing

In in-game layout, player can pause by pressing the pause button located in the upper right corner. Pause menu layout can be seen on **Figure 4**.

4. New score testing

When the player's health point reaches 0 the game will end. In this menu the player can enter a name with a maximum of 6 letters. If the player's score is higher than the score in the highscore menu, the current player's score will be submitted into the highscore menu. New score layout can be seen on **Figure 5**.

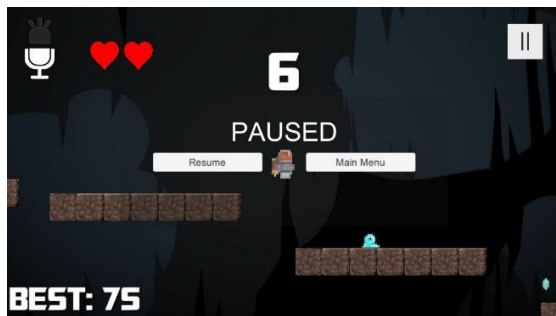


Figure 4. Pause menu



Figure 5. New score layout

5. Help menu testing

In this menu the player can see information on how to control the characters and information on objects contained in the game. Help menu layout can be seen on **Figure 6**.

6. Highscore menu testing

This menu is a menu that contains the highest score ever achieved by a player. Highscore menu layout can be seen on **Figure 7**.



Figure 6. Help menu

NO	SCORE	NAME
1	75	JASON
2	65	VIR
3	50	BEST
4	35	ASUS
5	20	UNITY

Figure 7. Highscore menu

7. About menu testing

In the About menu there is a description of the game developer and mentor. About Menu can be seen on **Figure 8**.



Figure 8. About menu

3.2. Alpha Testing

Alpha testing is carried out by parties who have a role as representatives of potential users who will play this game. "Endless Jetride" alpha testing is done by the supervisor as a party who understands the concept and purpose of making this game. The comments are the icon that has no representative of voice control and the sound effect when jumping is too weak. Those flaws had been fixed according to the tester's instructions.

3.3. Beta Testing

Beta testing was conducted by 30 respondents from 7 June 2020 to 14 June 2020 by distributing online questionnaire. Questionnaire and game are sent using google drive link via Discord, Line and Facebook. The questionnaire consists of 15 questions.

3.4. Testing Results

Based on the questionnaire filled by 30 respondents, the following results are:

1. 80% of respondents said they had played a game with endless running genre. The test results showed that the majority of respondents had experience playing endless running genre games.
2. Only one person (3.3%) claimed that he had played game using voice control.
3. "Endless Jetride" has an average difficulty level 3.3 within the scale of 5, so the difficulty level of the "Endless Jetride" game is considered moderate.
4. "Endless Jetride" has an average difficulty level of using voice control 3.33 within the scale of 5, so the difficulty of using voice control in the game "Endless Jetride" is considered moderate.
5. The average of surviving time in "Endless Jetride" is 2.6 minutes. The longest surviving time is 5 minutes.
6. 96.7% of respondents stated that the gameplay is easy to understand without tutorial.
7. Sound testing is done by taking sound and converted to sound intensity, then the sound intensity is used to control the movement of characters. The test results show that players who play using enhancements such as earphones can control the main character better than those who are not using enhancements. And playing in a quiet place is better than playing in a noisy place.
8. All respondents have an Android smartphone with minimum operating system Android 5 Lollipop, so it is recommended to play the game "Endless Jetride" on smartphone with Android 5 Lollipop or above.

From the test results, there are many suggestions and comments from respondents. Like bad accuracy of the sound, it works based on the level of sensitivity of the microphone in capturing sound, it is recommended to play the game "Endless Jetride" using earphones and in a quiet room. How to control the customized characters, the game "Endless Jetride" is made with controls that are complex so that the game becomes not too easy and boring.

4. Conclusion

After completing the testing of the game "Endless Jetride", the following conclusions can be drawn from the data:

1. "Endless Jetride" game provides quite difficult challenges for players in the form of avoiding obstacles that appear continuously and get the highest score.
2. Game "Endless Jetride" does not require introduction or tutorial because the gameplay is similar to other running games in general.
3. Game "Endless Jetride" has a unique control system by using player's voice.
4. The game "Endless Jetride" can provide a better playing experience if played using earphone or headset and in a quiet room.
5. Recommended smartphone is to has a minimum operating system of Android 5 Lollipop.

5. References

- [1] Kamus Populer, *Pengertian Game Menurut Para Ahli*, <http://www.mandalamaya.com/pengertian-game-menurut-para-ahli/>.
- [2] Michael Klappenbach, *What is a platformer game?*, <https://www.lifewire.com/what-is-a-platform-game-812371>.
- [3] Novaldo Rustandi, Jeanny Pragantha, Darius Andana Haris, 2019, *Pembuatan Endless Running Game "Run 'N Escape" Berbasis Android*, Jurnal Ilmu Komputer dan Sistem Informasi, Jakarta: Program Studi Teknik Informatika Fakultas Teknologi Informasi Universitas Tarumanagara.
- [4] Bob Bates, 2004. *Game Design* 203-216.
- [5] Alan Thorn, 2014, *Game Development Principles* 3.
- [6] Ernest Adams, *Gamasutra - The Designer's Notebook: Sorting Out the Genre Muddle*, http://www.gamasutra.com/view/feature/132463/the_designers_notebook_sorting_php.