Design and Develop a First Person Shooter Game with Unity Based on Windows

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Abstract – In this modern era, gaming has become pervasive, reaching individuals of all ages. The evolution of games, from the 1966 Brown Box to the current eighth console generation, reflects diverse themes such as World War, sports, fantasy adventures, and historical events. The popular First Person Shooter (FPS) genre offers an immersive experience, evolving over the years with numerous games like Crazy Pixel Apocalypse, Gun War Z, Krunker, and Assault Force. These serve as references for designing a new FPS game using Unity on Windows, aiming for a captivating experience. Beyond entertainment, the game's objective is to enhance cognitive skills. The zombie-themed FPS genre promotes problem-solving, strategic thinking, quick decision-making, and lateral thinking, contributing to cognitive development. The FPS game, known for its firearm-focused action in a war-themed setting, is played in a 3D format with a first-person perspective. This discussion extends to the realm of e-sports, reflecting the growing popularity of online-based sports competitions. In conclusion, the study strives to develop a successful Unity-based FPS game on Windows, drawing inspiration from diverse reference games.

Keyword : FPS Game, Unity, Windows, Design Game, 3D Game.

I. INTRODUCTION

Games are no longer unfamiliar in this increasingly modern era; people of all ages now know how to play games, even toddlers. With the advancements that exist, games are also progressing, following the appropriate era.[1]

The history of this game began in 1966 with the Brown Box, which was the first-generation console game. It then rapidly developed and has now evolved into the eighth generation of game consoles. In this era, people's ideas for creating various games with themes such as World War, sports, fantasy adventure, and historical or significant events that have occurred have advanced even further.[2], [3]

Nowadays, one of the most popular games is the First Person Shooter (FPS) game. This FPS game has a unique aspect because we can play the game as if we are inside it, with ourselves as the point of view or first-person perspective in the game.

As the years go by, the FPS game genre continues to evolve. There are now numerous FPS games with various enemies, themes, storylines, and more. The abundance of similar FPS games circulating serves as a valuable benchmark and reference for designing and developing a similar FPS game. For example, there are four similar FPS games that will be compared as a reference for creating an FPS game with Unity based on Windows. These games have different features, graphics, and storylines. With the existence of these reference materials, it is hoped that the game being developed can be better and capture the interest of game enthusiasts.

The purpose of creating this game is, of course, to produce a more engaging, high-quality, and successful game in the market. However, besides entertainment and education, playing games can also make someone more responsive and enhance cognitive skills. Playing games often involves problem-solving, strategic thinking, and decision-making. Therefore, playing this zombie-themed FPS game can help players develop cognitive skills such as lateral thinking, planning, quick and accurate decision-making, and problem-solving.

Furthermore, this game is designed and built to assist a large number of people or some individuals who always feel bored while working. The game is created to eliminate that boredom because in this game, there is only one stage.

II. DISCUSSION AND DESIGN

The First Person Shooter (FPS) game, commonly referred to as an FPS game, is an action game that revolves around the use of firearms. It is generally characterized by gameplay focused on shooting bullets, often in a war-themed setting. The term "FPS" primarily refers to the perspective from which the game is played, emphasizing the first-person viewpoint of the player.[4]

Fig. 1. Example of an FPS Game

This game is played in the form of a 3D video game, with a first-person perspective that displays the character's viewpoint on the monitor screen. The discussion regarding FPS games leads us to the world of gaming, which has transformed into one of the online-based sports known as e-sports or electronic sports. In today's era, e-sports competitions have gained significant popularity, and they are now being held worldwide.[5]–[7]

The four games that are being compared as points of reference there are, firstly Crazy Pixel Apocalypse, this game developed by Mentolatux and released in 2017, this game has a unique aspect of resembling Minecraft but with an FPS action genre.

Second game is Gun War Z, this game developed by IT-Hype, this game provides a unique experience where players simulate being in a helicopter and rescue humans from zombie attacks.

After that the game named Krunker, developed by Yendis Entertainment in 2018, this game shares similarities with Crazy Pixel Apocalypse, resembling Minecraft in its visual style.

Last, Assault Force developed by Faramel Games in 2019, this game stands out for its realistic visuals and aggressive yet easily defeatable zombie enemies.

These games are being compared based on their graphics, features, and game scenarios to serve as references for the development of the new game.[8]

III. RESEARCH METHODOLOGY

Designing an FPS (First Person Shooter) Game

The designed FPS (First Person Shooter) game has a zombie theme set in a particular area. To design and create this FPS game, Unity is used as the development platform, with Windows as the operating system. The game also requires suitable hardware devices. [9]

The game development process utilizes an Asus X550J laptop with the following specifications: Intel® Core™ i7 - 4720HQ CPU 2.60GHz (8 CPUs) - 2.6GHz, 8.00 GB RAM, and Windows 10 Pro 64-bit operating system based on x64 processor architecture.

The software used includes Unity 3D version 2019.3 for game design and development, Blender for character creation, and Fuse Mixamo for animation and character movements.[10], [11]

The game is named Zombie Runner[1], The reason behind creating this game originated from the idea inspired by Resident Evil 3, which tells the story of a pandemic caused by the T-Virus created by the Umbrella Corporation. As the virus spreads and infects humans, the focus shifts to finding ways for humanity to survive amidst the chaos.[12]

as it features an action-packed concept with zombies. Here is the concept or game scenario within it :

1. Character Concept
   a) Hero: This character is the main protagonist who will face and fight against the enemies or zombie robots depicted in the game.
   b) Enemy : The characters in the game are the zombie robots, which serve as obstacles or challenges for the hero.
2. Gameplay Concept
   The gameplay concept for the first level starts with the player beginning the game equipped with a firearm and being required to complete the level. In this level, there are 12 zombies. If the player is still playing and running low on bullets or energy, they can search for resources within the maze and avoid incoming zombies.

   Once all the zombies are defeated, the player is declared successful or has passed the level.

3. Rules Concept
   a) The concept of rules in this game is that when entering the first level, the player will be equipped with a weapon. If a bullet hits an enemy, it will deal 20 points of damage, reducing the enemy's health from the initial 80 points. Therefore, it will take 4 bullets to defeat the enemies.[13]
   b) The player starts with a health of 120 points. When the health reaches 0 points, it will result in a game over. At this point, the player will have the option to either play again or exit the game.[13]

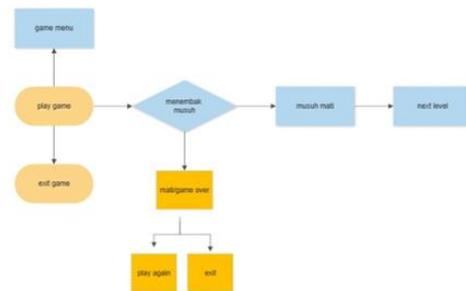And this is the gameplay flow that will be played by the player :

Fig.2. Flowchart of the Gameplay Flow

The comparison conducted for research purposes involves four games, considering their graphics, features, and game scenarios as points of reference. An example of the comparison for designing this game includes clear and smooth graphics, comprehensive features, and engaging game scenarios.

After conducting the comparison, the research was continued by conducting interviews with 5 individuals who enjoy playing games[14][15]. The results obtained are as follows :

1. Question
    1) Age
    2) How many years have you been playing games?
    3) What aspects of a game do you enjoy the most?
    4) Have you ever played an FPS (First Person Shooter) game before? Please provide your reasons.
    5) How do you feel when playing FPS games?
    6) What aspects should be considered, such as suggestions or criticisms, in a game?

IV. RESULT AND DISCUSSION

During the research period, the researcher conducted interviews with 5 individuals experienced in playing games and also compared games with similar themes. This comparison was carried out to evaluate the game created by the researcher, serving as a reference for identifying essential elements in a game, such as features and smoother graphics.[16]–[18]

For the interview-based research, the researcher aimed to delve deeper into understanding the extent of users' mastery of the game. The participants selected for the study were questioned about their age, the duration of their experience with FPS games, and specifically asked about the features they consider necessary and desirable in a game. This approach was undertaken to gather insights into the preferences and expectations of the gaming community, contributing to the identification of key elements that should be incorporated into a game.[16], [19]

After conducting research through a comparison of four games namely Crazy Pixel Apocalypse, Gun War Z, Krunker, and Assault Force. The following results were obtained.

TABLE I. RESULT OF COMPARISSON

| No. | Comparison result | | | |
	Comparison Games	Graphic	Features	Game Scenario
1.		Advantages: The graphics of this game are quite good, resembling Minecraft. Disadvantages: Since the game resembles Minecraft, it may feel less suitable.	Advantages: There is a server selection feature in the game. Disadvantages: Other features in the game are limited to only weapons, heroes, and enemies. There are no other additional features.	Advantages: Playing this game provides its own excitement and allows players to experience the thrill of shooting. Disadvantages: It may not be suitable for all age groups and is more suitable for children. However, this raises concerns as the shooting scenario may not be appropriate for children.
2.		Advantages: The graphics appear clearer and smoother in this game. Disadvantages: There are many bugs present when playing the game.	Advantages: The game has multiple levels and rewards that can be obtained by defeating numerous zombies and utilizing different strategies. Disadvantages: There are many icons and features that are difficult to understand, such as the feature to obtain bonuses.	Advantages: There are many playable levels in the game, and the backgrounds are visually appealing. Disadvantages: The gameplay duration is too short, limiting the number of zombies that can be eliminated, and the backgrounds become repetitive and lack variety.
3.		Advantages: The graphics in this game are smoother and resemble Crazy Pixel Apocalypse. Disadvantages: It is not very clear where the player is located while playing.	Advantages: The game features playable maps and weapon customization options. Disadvantages: The maps are not clearly defined, and it is difficult to determine the origin of the enemies.	Advantages: The game allows players to start playing directly without the need to choose weapons. Disadvantages: It is not clear which direction the player is heading while playing.
4.		Advantages: The graphics in the game have a realistic appearance. Disadvantages: The graphics are not yet clear or sharp.	Advantages: The game includes a time feature during gameplay. Disadvantages: The features are not complete, there is no map, and there are still many bugs when using the available features.	Advantages: It is easy to eliminate enemies in the game. Disadvantages: The enemies cannot be predicted in terms of their origins or entry points.

Based on the interviews conducted with 5 respondents aged between 21-24 years[20], the following results were obtained:

1) They have been playing games for approximately 10 to 15 years.
2) They enjoy aspects such as graphics, game story, characters, and strategy when playing games.
3) All of them have played FPS games before, and they find it exciting and immersive, thanks to the first-person perspective.
4) The key considerations for FPS games based on their feedback are improving graphics quality, providing more challenging game stories, avoiding pay-to-win mechanics, and incorporating features that are easy to understand.

These findings highlight the preferences and experiences of the interviewees, which can be taken into account for the design and development of FPS games. And based on the results of the comparison and research, as well as the interviews conducted, the game design is generated as follows :

1) Graphics

Fig. 3. *View Of Game*

Fig. 4. *Shadow With Light Effect*

The graphics, based on the research findings, have been improved in the design phase to become clearer and more realistic in appearance.

2) Features

Fig. 5. *Shotgun*

Fig. 6. *Overall Design and Map Layout*

The game features include a Map that provides direction to help players navigate and indicates the origin of enemy encounters.
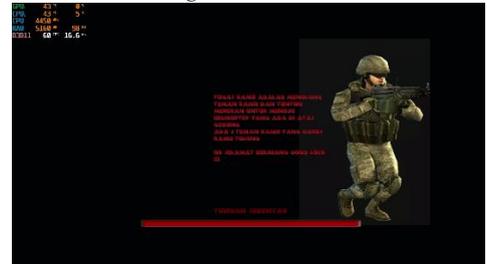
3) Game Scenario

Fig. 7. *Main Menu*

Fig. 8. *Intro of the Game*

Fig. 9. *Starting of Game*

Fig. 10. *Game Over Design*

Fig. 11. *Winning The Game Design*

The game scenario begins with the player being presented with the option to choose between "Play Game" and "Exit" at the start. When the player loses, they are offered the choice to "Play Again" or "Exit." If the player wins, the game proceeds to the next level without interruption.

to divine timing and author's parents for unwavering support.

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