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2-Dimensional Game Development Using Unity Game Engine

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ABSTRACT

Over these past few year's games have really been a topic of discussion. With latest smartphones people can really take pleasures of High-end games just by one click. So, with the increase in the demand of games the need for more game developers is imminent and clearly visible with international championships being held so from here the scope of game development is only at its beginning stage. Our 2-Dimensional game is built on Unity Engine. Unity is one of the most popular game developing platforms where the games like Assassin's creed, Call of Duty being developed on this very platform. Some big-time rivals of unity are Godot Engine, Unreal Engine, G Develop etc. Language used in developing the game is C#. we can create the character, background, add sounds all in unity platform. The name of our 2-Dimensional game is Dragon Doom where a dragon has to pass the obstacles in order to get the highest score.

Keywords: C#, Background, Unity, Dragon Doom

1. Introduction

Game Development is all about making, developing and releasing of a game. This generally involves the generation of general concept, testing and releasing. While we make a game, it is utterl important to discuss the game mechanics, awards, gameplay and design. Game developer can become a game programmer, a audio designer, a character, designer or many other tasks that are there in the gaming industry. It can be as small, medium or large as we want. But the game must let the players interact with game contents and is very much able to change the game elements and contents, only then you can call it a 'game'. To resolve the problems that in game frameworks have, tools like lib GDX and Open GL were developed. They helped in game development process to be a lot faster, efficient and easier, this provides a lot of pre-made functions, options and features. However, it was still very hard to enter into the industry or to fully understand the framework for someone who is coming from a non-programming background, and it is a very common case in the game development scene. But once someone enters this industry and is interested in the work, he may not regret it.

2. Need for Game Development

Today, game design and development has completely become a completely different and dedicated field of study where some people choose to focus only on design over writing the code. The concept of experience and enjoyment are very important to both players and the developers. Players want a very exciting experience and that acts as a temporary distraction or just helps them kill time. For a game creator, the players' enjoyment and excitement is directly tied to the success of the game. There are lot of things when us design it (modelling, mapping, sound editing, 2D graphics edition and creation, conceptual drawing, sound editing, story telling and creation, animation of 3D characters, prop design, resources optimization tasks) and these things have to kept altogether in mind to get the perfect output.

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3. What is Unity Engine

Unity is a 2D and 3D game development engine and framework that provides us a platform for designing the game and scenes of apps for 2D, 2.5D and 3D. Unity allows us to interact with the game with not only code and also visual components, and then exporting them to all major mobile platforms and that's absolutely free. Unity supports almost all the many audio formats and 3D applications, and even understands the Photo shop .psd format. we have to just drop a .psd file in a Unity project. Unity gives us an option to assemble and import assets, also writes a code to directly interact with our objects, import or create animations which we can use for an advanced animation system, and so much more. The most powerful part in Unity is Unity Asset Store, one of the best asset markets in the gaming asset market. In it you can find all of your game component needs and requirements, such as animation files, artwork for our 3D models, sound effects and full audio tracks, plug-ins—including all those very much like the Multi-Platform toolkit that can be helpful with multiple platforms. So, unity has so many features and yet it is very easy and efficient. These were the main reasons why we opted for unity game development over other development platforms like unreal etc.

4. Features of Game Development

A. Immersion: A. Immersion: One of the many things that will leave an impression is how immersed the players are in your game world. There are some games with such an honest game design and storyline that it causes you to desire you're living and inhaling that world as you play.

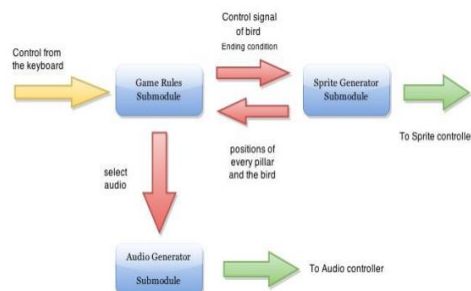
B. Story and character development: just like movies and books, video games have become the whole new level of storytelling, that game developers benefit of from. This is the thanks to how well these kinds of games sell. Emotional stories are quite familiar in video games world. I'm very confident that at some point one must have stumbled upon a story that affected us emotionally in one way or the other. It seen that Games with good character and story, often seems to catch more attention of gamers as compared to a game with no development

C. Graphics: Besides having a very good and progressing storyline, the audio and visual appeal also plays a very big part in your game's success. this could even be a defining factor on whether people will buy the sport or not. nobody wants to play a game stuffed with graphic-glitches and art unappealing to the eyes. Through the years, game designs have evolved, but there are some games that have outdone themselves; some games are fine detailed which it might be mistaken for being real instead of a game.

D. Socially competitive features: Most games these days offer us the option to play with or against your friends and other players from all around the world. To be able to play along with friends in real-time will obviously increase engagement depth and prolong periods of time. With friends we can play for duration of time and be fully immersed in a game. So the social factors like these increase the immersion of the game.

5. Methodology

The basic methodology includes creating a new 2-D project, handling the background that will be displayed throughout the game and when the difficulty increases the background starts to move at a higher pace mainly to increase the difficulty. Above that would be a layer of obstacles which would be constantly varying thereby increasing the difficulty the next step includes setting up a main camera that will follow our game character at all times then we set up our obstacles here they are depicted as pipes and our character has to dodge those stable pipes to increase the score. Then comes ground handling that will handle our moving ground and then we finally create our character here it is Dragon named 'Droggo'. And then the final step comes of compilation of all our handlings as well as the character. Another important step is to create a main menu where high score will be shown.



6. Summary of Game Development

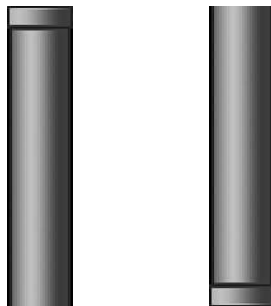
In this research paper

- 1) Game Name: Dragon-Doom
- 2) Game Genre: Arcade
- 3) Platform: Supports Multi-platform (Wiindows PC, Android, etc.)
- 4) Game Characteristics: The game is a side-scroller where the player controls a dragon, attempting to pass through columns of pipes without hitting them. The various components depicted in the game are

1. **The player character:** The Character, which is a Dragon is capable of flying when a tap on the screen or a mouse click is detected.



2. **Obstacles:** The Obstacles in the game are a pair of upside-down pipes. The Dragon is required to pass through the gap in between these pipes and colliding with any of these would end the gameplay



3. **Game Environment:** The Arena consists of an image of space in background. Above that would be a layer of obstacles which would be constantly varying thereby increasing the difficulty. This would be achieved by decreasing the gap between the pair of pipes.



4. **Score Counter:** Placed exactly at the top in the centre, this would count the player's score. Each successful pass through a pair of pipes awards the player one point.



5. **Player Movement:** The Dragon would be seen in the position as seen in Image 1. As soon as the user taps on the screen or clicks the mouse, the player movement changes into something similar shown in Image 2.



6. **Game Start Screen:** This would be seen when the game starts or when a player wishes to play the game again after his previous gameplay ends. The first screen shows a simple message, "Tap To Jump"; thus directing what to do.



7. **Game End Screen:** This would be seen when the Dragon collides with a pipe or the ground, thus ending the gameplay. He/she would be greeted with a pop-up which displays the Current and the High Score.



This study aims to design and develop a gaming application using Unity Game Engine. Through this cornerstone for a new concentration on Game Development, we have conveyed our views and ideas on promoting education via innovation. The functions that Unity3D supports autonomously are very abundant. All game developments are possible such as shader physics engine, network, terrain manipulation, audio, video, and animation, and it is enabled so that it is possible to revise, meeting demand of user according to the need.

7. Technology Used

Unity3D Engine: The whole project is based on this platform. It is the ultimate game development platform. Unity Engine offers a very pleasing all-in-one editor which boasts the latest and best tools for developing, launching 2D games. The unity3D engine also provides SDK's and development environments for Window's, MacOS and Linux systems.

Sprite Workflows: Unity Engine's sprite workflow editor and features were used to scale and slice the texture sheets to get every individual frame to be in the perfect scale. With the aid of Animation and Animator, you can group together sliced images to add animation to the avatar the frames per second feature allowed us to get the perfect cycle range for our animations.

Object Oriented Programming in C#: One of the most useful abilities of the C# language is its capability to make all the components work together and communicate with each other. With the aid of C# language, you are allowed to attach individual behavioral scripts to each game component, this way information can be shared between each component. Eventually you are provided with an UI to make the game as interactive and feature full as possible.

Photoshop: It is one of the most popular and recommended photo editing and image manipulation software; this application was used to create pixel art images which forms the main art assets of our game.

Audacity: Audacity is an open-source audio editing application that was used to make sound effects and add a depth to the game.

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