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Game Development Using Hammer Tools and Valve Source Engine

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Abstract: Defence of the Ancients 2 (DOTA2) is a well-known multiplayer Action RTS game developed by Valve Software Corporation. It is well known among lots of children and even among mature audiences. The rules and regulations of this game are well-known in the eSports scene. This case study is meant for implementing a different fast-paced version of this game without losing its attraction. This game comes with a multiplayer mode. Path of Valor is an easy game for all. The graphics of the game system is good and smooth to control for the users. Talking approximately the gameplay of the system, the game has a simple character that has few skills sets and the users are supposed to use those skills to obtain kills on the enemies. In Arena of Valor, the player has to use their motor and analytical skills to kill the enemy units. The game requires the players to use spells using the keyboard and manage the movement of their units using mouse clicks. It is a 5v5 multiplayer game and the victor is decided based on which team reaches a targeted number of kills first in the game. This game has a simple aim to provide a fun time to the players and allow them to refine their reaction time in the game.

Keywords: Real Time Strategy, eSports, Game Graphics, Multiplayer

I. INTRODUCTION

This paper describes the process of making a 2D Top-Down RTS game, Arena of Valor with Valve Hammer Editor. This game is for PC only. This chapter discusses the game overview and including the target audience, description, then focuses on the game design, describing how the game is implemented.

2D RTS games are very popular on PC as well as mobile devices. The RTS game like Dota2 and League of Legends has more than 10 million unique players each month. This shows that a large base of players are interested in this genre and gives us a good opportunity to tap into the market by following traditions that are already set for this genre. Our main targets are players between the age group of 13 to 25.

The game involves a team of 5 players enter an arena and face another team of 5 players who are there intending to get the greatest number of kills in the game. The game revolves around a small map that has been covered with trees as a hiding spot for enemies and the allied players. The game requires the players to use the skillsets that are provided like short distance teleportation and a combination of ranged as well as melee attacks to take down the enemies. Whichever team reaches the targeted kill threshold first wins.

II. RELATED WORK

Video Games are electronic games that involve interaction with a user interface such as controllers on consoles or keyboard and mouse on PC. Recently there has been an exponential increase in the number of people who have started to game on at least one or more of these devices. With such an increase in popularity in this past decade many game developing companies have started to release much harder and skill-based games than before. Many competitive multi-player-based games have become very popular in the past few years and many are yet to come. With also the increase in popularity of eSports, a lot of young as well and veteran gamers have started to take gaming as a serious sport. Many sports organizations such as Paris Saint-Germain have started to take interest in eSports. With an increase in competition comes the requirement of higher skill-based players with lightning-fast reflexes and decision-making skills. This is where our game comes in. Arena of Valor is designed to make players think and react in a very short duration. This is a fast-paced game designed for players who want to polish their skills.

Top eSports Games in 2020 are:

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1. Counter-Strike Global Offensive: With a total prize pool of $14.75 Million, CS: GO takes the top slot in the eSports industry. With the pandemic forcing everyone into their homes this game became a favourite among a lot of FPS players. With the price tag of free this game was very easy to get and play and with a lot of players already being familiar with the playstyle of point and shoot this game had an exponential increase in the player base with a whopping 24 Million monthly active players.

2. Defence of the Ancients 2: With a total prize pool of $8.87 Million, DOTA 2 takes the second spot on the chart. Due to the pandemic the biggest tournament of DOTA 2 eSports scene was cancelled which was supposed to have a prize pool of $40 Million moved it to the second spot. Dota 2 is an RTS game that was launched by the valve in 2013. It's also a MOBA game that has been a fan favourite in past many years. Dota 2 was the first eSports to have a Million-dollar Prize pool back in 2013 which gave a big boost to the esports industry.

3. League of Legends: With a prize pool of $8 Million, League of Legends takes the third spot on the chart. League of legends is also a MOBA game that was developed by Riot Games in 2009. It was inspired by Defence of the Ancients, a custom map of Warcraft 3. It has been very popular in North American and Europe as well as South Korea.

The following major features of this game are:

i. A free to play RTS game that allows for both fun and practice.
ii. Has multiple types of skillsets that allow for versatile plays.
iii. A combination of ranged and melee attacks allows players to fight as per their style.
iv. A Fog of War mechanic that restricts the players from seeing past a particular distance.
v. Mab objects that obstruct vision for both teams to allow them to use the Fog of War mechanic to their advantage.

III. AIM AND OBJECTIVE

The following major objectives of this game project are:

i. To create a fast-paced RTS game that has similar functionality of traditional RTS game.
ii. To implement short distance teleportation ability in game for easier movement of players.
iii. To implement combination of ranged and melee attacks that allow players to get to their objective.
iv. To add sound effects to enemies and player units to be able to hear and react to the attacks that are launched on them.
v. To add a Fog of War mechanic that restricts the players from seeing past a particular distance.
vi. To design game maps simple and easy to understand for players.

IV. EXISTING SYSTEM

Currently, multiple RTS games are very popular such as StarCraft 2, Age of Empires, and World of warcraft. One thing common about all these games is that they are very performance-heavy games and also require a significant amount of time to be learned and played. Many people do not have so much free time in their busy lives so they can spare hours to learn and then play a game. These games also have a very steep learning curve which can be very taxing on player's mindset if they play for a long number of hours so there has to be an alternative to these approaches. There seems to be a need for small low requirement games that are easy to play and enjoy that can act as both a relaxing game for people as well as a training or warmup game for competitive players. There are multiple arcade games available in same genera and all of them offer different features but we have made a game as per we see its value for current players and for upcoming players.

V. PROBLEM STATEMENT AND SCOPE

Video games have been a part of the childhood of many people and many people still consider them a big part of their lives. They have evolved significantly in the past decade and now has become a big part of the economy as a whole. Video games have gained a lot of traction among mainline sports industry with a revenue of about $37 Billion in 2020

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alone. With such huge market there is always a constant demand for new games. Gaming industry has released many AAA titles over the years and a lot of people liked those games but not everyone can afford games that cost a minimum of $60 and can go up to $150, due to this there has been an increased demand for games that are not as expensive and performance dependent which can be played by new as well as veteran players alike and serve both their needs for fun and little competitiveness among their friends.

VI. PROPOSED SYSTEM

The game is derived from the idea of death matches in FPS games. This game uses the same kill system of death matches in games like CS: GO or Valorant where the winning party has to get a certain number of kills to win the match and players only have to focus on individual battles rather than the team as a whole. This allows them to focus on their play style and improve their reflex as well as the knowledge of when to and not to take fights in a match. This improvement in individual skills can help them later in their ranked games where they have split seconds to decide whether to take a fight or to cut their losses. This game uses these tactics to improve the players or if the players want, they can play among friends to just have a good time. Each match can have a maximum of 10 players and these players are split into 2 teams their only goal is to achieve as many kills as they can to lead their team to victory.

VII. METHODOLOGY

The software methodology we used to develop this game is Agile methodology which is an approach for developing products (in this case: Games) using short iteration. The main idea is not making the entire project from start to finish but making small features for the current project in small periods. In this way, the result of each iteration is used to adjust the project plan.

i. Each Iteration is a short project in itself.
ii. Uses “inspect and adapt” practice to adjust the goals and measure progress.

The tools we used in development of this game are as follows:

i. Hammer Level Editor: We used Hammer's new tile system to quickly layout our map, then fine-tune our creation with its powerful 3D modelling tools. An embedded Asset Browser also lets us browse and use models, particles, and materials, and quickly drag them into the level editor. Using these powerful lighting options in the 3D view to see exactly what our creation will look like in-game.

ii. Material Editor: We can create materials and directly import them easily into the game with the Material Editor. Tune shader parameters and update textures while viewing our changes live in-game.

iii. Material Editor: With the Model Editor, we can preview model appearance and animations as well as author gameplay details such as hitboxes and attachment points.

iv. Scripting with LUA: With its long and well-documented history in a variety of existing games, Lua scripting gives authors a versatile tool to forge their creation. Most of the game's functions can be accessed through script including hero abilities and modifiers, spawning NPCs and particles, or even changing global settings. It also allows to listen for events that happen in the game, such as entities being damaged or killed, and items being picked up. Additionally, we can create our events.

VIII. FUTURE SCOPE

In the future, this game can be improved by adding multiple maps for players to play on. New characters can also be added to increase the versatility of players and give them a choice of playstyle. Add maps with NPC for people who want to play in single-player mode. Improvement in optimization for the game as well as make the game available on phone and other mobile devices.

IX. CONCLUSION

With the change in gaming environment there has to be a change in the approach that is taken while games are made. So we have made a game that has selection system for characters, character skill sets, multi-player approach, Fog of War mechanics, character items, user interface and also good mechanics. Gaming industry has been a pretty closed and conservative industry since the beginning and not a lot of people are aware of how to work in such industry so we have

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also tried to break that stigma here. We wanted to give our own contribution to the gaming world by making a game that brings people joy and fun and we feel we have successfully implemented that.

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