3D ACTION-ADVENTURE GAME WITH IMPROVED PLAYER EXPERIENCE

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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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JUDUL: 3D Action-adventure Game with Improved Player Experience

SESI PENGAJIAN: 2016

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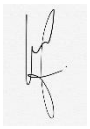

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3D ACTION-ADVENTURE GAME WITH IMPROVED PLAYER EXPERIENCE

LIM YONG SHENG

This report is submitted in partial fulfillment of the requirements for the Bachelor of Information Technology (Game Technology)

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA
2016

DECLARATION

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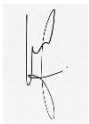

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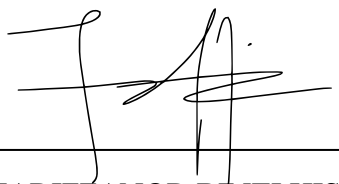
I hereby declare that I have read this project report and found this project report is sufficient in term of the scope and quality for the award of Bachelor of Information Technology (Gaming Technology) With Honours.



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ACKNOWLEDGEMENTS

I would like to thank my project supervisor Ms. Syariffanor Binti Hisham of the Faculty of Information and Communication under the Department of Media Interactive at University Teknikal Malaysia Melaka (UTeM) who always guides me along the process of doing this project. She always provides me the right paths whenever I have encountered a problem. I would like to thank my course mates also because they lend me a hand when I have problem throughout this project. I would also like to thank my beloved parents who have been giving me support and motivation throughout my project. By here, I deeply appreciate the helps from the people whoever provide support to me by directly or indirectly.

ABSTRACT

The project is about the development of a 3D action-adventure game named Teleported which is developed on Unity3D and programmed using C#. The target audience of the game are teenagers who aged between 13 and 18. The game is inspired by a Windows game which is Magic Secret Agent. The main objective of the game is to enchance the player's experience which is lacked in 2D game. The game is requires player to control a character to move around in a 3D game world. The character has an ability of teleport which allow him to launch or shoot a magical ball to a position and teleport to the ball's position. The teleportation also can use to avoid the traps and enemies because the character only can run but not jump in the game. Player needs to find keys and solve the puzzles to unlock a portal which can navigate to next level. The literature review has some evidences to support that player's experience in 3D game is better than player's experience in 2D game. The methodology used in this game is agile and it is broken into four phases which are Background Study, Development, Testing and Documentation. The analysis part shows the requirements of the game in the aspect of technical requirements. The design part shows that the architechture, game design and game art of the game. The expected output of the game is a 3D action-adventure game that will be developed to let the players have new player's experience and challenges while playing the game.

ABSTRAK

Projek ini adalah mengenai pembangunan permainan aksi-pengembaraan 3D bernama Teleporter yang dibangunkan dengan menggunakan Unity3D dan diprogramkan oleh C#. Penonton sasaran permainan ini adalah remaja yang berusia antara 13 dan 18. Permainan ini diilhamkan daripada permainan Windows yang bernama Magic Secret Agent. Objektif utama permainan ini adalah bagi meningkatkan pengalaman pemain yang kekurangan dalam permainan 2D. Permainan ini memerlukan pemain untuk mengawal watak untuk bergerak dalam dunia permainan 3D. Watak ini mempunyai keupayaan teleport yang membolehkan dia untuk melancarkan atau menembak bola ajaib ke sesuatu kedudukan dan teleport ke kedudukan bola tersebut. Keupayaan teleport ini juga boleh digunakan untuk mengelakkan perangkap dan musuh-musuh kerana watak hanya boleh berjalan tetapi tidak melompat dalam permainan. Pemain perlu mencari kunci dan menyelesaikan teka-teki untuk membuka sebuah portal yang boleh pergi ke tahap seterusnya. Kajian literatur mempunyai beberapa bukti untuk menyokong pengalaman yang pemain dalam permainan 3D adalah lebih baik daripada pengalaman pemain dalam permainan 2D. Kaedah yang digunakan dalam permainan ini adalah tangkas dan ia dipecahkan kepada empat fasa iaitu Kajian Latar Belakang, Pembangunan, Ujian dan Dokumentasi. Output yang diharapkan dari permainan ini adalah permainan tindakan-pengembaraan 3D akan dibangunkan untuk membiarkan pemain mempunyai pengalaman dan cabaran yang baru semasa bermain permainan ini.

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LIST OF ABBREVIATIONS

3D	**-**	**Three dimensional**
2D	**-**	**Two dimensional**
PC	**-**	**Personal computer**
RAM	**-**	**Random Access Memory**
API	**-**	**Application Programming Interface**
I/O	**-**	**Input/Output**
AI	**-**	**Artificial Intelligence**
UI	**-**	**User Interface**
OS	**-**	**Operating System**

CHAPTER I

INTRODUCTION

1.1 Project Background

Teleporter is a three-dimensional (3D) action-adventure game developed on Unity3D and programmed in C#. The target audiences of the game are teenagers who aged between 13 and 18. The game requires player to control a character named Lojo to move around in a 3D maze world. Lojo has an ability of teleport which allow him to shoot a magic ball and teleport to the ball's position. The ability of teleport can be used to avoid traps in the game. There are also some puzzle games in the maze that require Lojo to solve it.

1.2 Problem Statements

Teleporter is actually inspired by a two-dimensional (2D) Windows game named Magic Secret Agent which the game character also has an ability of teleport. However, there are some problems with the Magic Secret Agent. The problems are player is lack of experience when playing the Magic Secret Agent because the game is in 2D. There is also lack of actions in Magic Secret Agent and exploring is limited in the game because the game has a full map view.

1.3 Objectives

The first objective of the game is to study the differences of player's experience in 2D and 3D action-adventure game. The second objective is to develop a 3D action-adventure game with a proposed interaction. The third objective is to evaluate the player's experience in a 3D action-adventure game.

1.4 Goals and Genre

The goal of the game is for entertainment. The ability of teleport can let the player has fun when playing the game. Player can experience the fun of exploring and teleporting in a 3D maze which filled with traps and puzzles. The genre of the game is action-adventure because the game requires player to move around the game world by using ability of teleport to find the keys and solve the puzzles to unlock the portal which will navigate to next level. The sub-genre is adventure because the game world is big enough for player to explore.

1.5 Game Features

The target players of the game are the players who like to explore and who are willing to spend their time in exploring the game. This is because the game needs to take quite long time to finish so this game is not suitable for those people who are casual gamers.

The rules of the game are very simple. Player has to use the ability of teleport to avoid the traps in game. Once the player has touched the traps, the player will back to the start position. The game does not implement life system, that means the game does not end even the game character has die for many times.

The advantage of this game is that the game is provided save system. Even the game character will back to the start position when he touched the traps but the player can save anytime to prevent the loss of progression in game. Player can collects keys or solve puzzles in a level to unlock the portal which can navigate to next level. Player has freedom to choose whether to collect keys only, solve puzzles only or both. The victory condition is player completes all levels in game and there is no loss condition in game unless the player starts a new game and discards the previous progression.

1.6 Conclusion

By completion of this project, a 3D action-adventure game with improved player's experience compare to existing 2D action-adventure game is developed. Teleporter is developed for Personal Computer (PC) platform and its goal is for entertainment. Teleporter is developed by using Unity3D and programmed by C#.

The target audiences of the game are teenagers who aged between 13 and 18. The target players are the players who like to explore and who are willing to spend time in playing game. The game has no loss condition and it provides save system. The victory condition of the game is player completes all levels in the game. The following chapter will discuss about the literature review and methodology of the project. The literature review will show the existing game in the market which has similar gameplay with the project.

CHAPTER II

LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

This chapter shows the literature review of the project and also describes the project methodology that used in the project. The literature review covers the comparison of existing game with similar gameplay in the market.

2.2 Genre

The genre for this project is action-adventure. Action-adventure is a genre that combines two genres which are action and adventure. According to Oxford (2011), Action Games, who is Nintendo DS Expert said that video games in the "action" genre typically put emphasis on challenging the player's reflexes, hand-eye coordination and reaction. She said that today's action games are typically more complex even though the genre's core mechanics are still the same. Action games typically give the player multiple means of attack, though there's almost always a shared theme at work.

According to Bronstring (2012), What are adventure games? Adventure games are all about unraveling stories, exploring worlds and solving puzzles. Adventure games have been the most story-driven computer game genre for over 30 years. Adventure games found to have a true immersive quality that can be compared

to reading a book or watching a movie. Adventure games focus on puzzle solving within a narrative framework, generally with few or no action elements.

According to Swain (2011), What is an Action-adventure Game? Adventure games are about exploration and big worlds too look through while action games are fast paced games, with multiple button presses per second. Action-adventure game genre is a game genre that combines elements of the action game and adventure game genres. It is perhaps the broadest and most diverse genre in gaming. Platformer, sandbox, survival horror, stealth, first and third person shooters are all genres that fall under the action-adventure banner. According to Bronstring, Marek (2012), What are adventure games? Puzzle solving is clearly a secondary focus in action-adventure games.

2.3 Existing Games

There are two existing games that have similar gameplay and game features with Teleporter. They are Magic Secret Agent and Portal. According to Windows Central (2015), Magic Secret Agent is a Windows game that player plays the role of Agent Stephen Karsch and the mission is to navigate the various gaming levels and find evidence to send a collection of wanted criminals to the big house. The game includes dozens of levels filled with traps and goons to avoid, as well as switches to open secret doors that will lead you to the next level. The secret agent moves around by magically teleporting around the game.

According to The Orange Box (2007), Portal is a single player game that is designed to change the way players approach, manipulate, and surmise the possibilities in a given environment. The game character has equipped a device that can create inter-spatial portals between two flat panels. Players must solve physical puzzles and challenges by opening portal to maneuvering objects and themselves, through space.

Teleporter is a game that has both game features of Portal and Magic Secret Agent. Teleporter has the unique movement of Magic Secret Agent and it requires portal to navigate to next level. Teleporter is also filled with traps which similar with Magic Secret Agent and unsolved puzzles which is similar with Portal. Therefore, Teleporter is different in the aspect of gameplay and game features compare to Portal and Magic Secret Agent.

According to Windows Central (2015), Magic Secret Agent is deployed on Windows phone, Windows tablet, Windows laptop and Windows desktop. Magic Secret Agent is developed using Microsoft XNA and supported operating systems is Windows 8.1 and above.

According to The Orange Box (2007), Portal is developed using Source Engine and deployed on Windows PC, PlayStation 3, Xbox 360, OS X, Linux, Shield Portable and Shield Tablet.

Teleporter is developed using Unity3D as it is very famous engine and easy to use. It can also easily deploy the game to the platform such as PC, mobile and console but for Teleporter only deploy to PC with Windows.

2.3.1 Comparison of Existing Game

According to Silva, Marinho, Differences Between 2D and 3D games, She said that the player's experience in 2D and 3D games is not same. One of the most apparent differences between 2D and 3D games is their visual quality. Although 2D games oftentimes demonstrate excellent artistic design, 3D games are better at simulating reality.

As a result, many games that strive for realistic visuals choose a 3D game engine. Movement is also a difference between the player's experience of 2D and 3D games. 3D games allow players to move in a 3D world, meaning that players can move closer and deeper into the screen. On the other hand, 2D games restrict player movement to a flat plane, usually left and right, but may include various other directions as well. There is an example of Super Mario Bros which asks players to navigate a 2D world, moving from left to right until the goal is reached.

Since a game's dimensions determine the players range of movement, 2D and 3D games use different ways to control their characters. 3D games use joysticks to control their avatars. Joysticks allow players to move around in a 3D space and are tilt sensitive to control a character's speed. On the other hand, 2D games use digital pads that allow players to press up, down, left and right. Table 2.1 shows the comparison of existing games with similar gameplay in the market while Table 2.2 shows the comparison of existing games there are changed from 2D to 3D in the market.

Table 2.1: Comparison of Magic Secret Agent and Portal

Magic Secret Agent	Games	Portal
Touch screen, mouse	Controls	Joystick, mouse, keyboard
Move by using magical orb to teleport, avoid traps and goons and find evidence to send wanted criminals to the big house.	Gameplay	Move by open the portal by a portal device and solve physical puzzles and challenges by opening portal to maneuvering objects and themselves, through space.
Windows Phone, Windows PC	Platform	Windows, console, iMac, Linux
Requires Windows 8.1 and above	Operating System	Vary between platform
Microsoft XNA	Development Tool	Source Engine
Two-dimensional	Dimension	Three-dimensional

Table 2.2: Comparison of game that change from 2D to 3D

Comparison	**Donkey Kong**		**Grand Theft Auto**	
	2D	**3D**	**2D**	**3D**
Movement control input	Buttons	Analog Stick	Buttons	Analog Stick
Game world visibility	Able to see the whole layout of the game world at once	Third person view in a 3D environment that requires players to explore the game world by themselves	Top down view that can see the layout from a part of game world but still needs to explore	Third person view in a 3D environment that requires players to explore the game world by themselves
Movement	Only able to move left, right, up and down	Able to move in all directions	Able to move in all directions	Able to move in all directions
Gameplay	Control the character to avoid obstacles and save princess	Able to walk around, swim, dive in the game world and needs to beat bosses to win the game.	Able to fight, drive all kinds of vehicles and needs to avoid from get caught by police.	Able to fight, drive all kinds of vehicles and needs to avoid from get caught by police.
Game mechanics	Score, life, powerup	Collectables, powerup	Score, powerup	Score, powerup

2.4 Project methodology

The project methodology that is selected for this project is agile development process. This project is broken up into four stages. The stages are background study, development, testing and documentation. Figure 2.1 below shows the flowchart of the project activities in this project.

2.4.1 Stage 1: Background Study

This stage involves brainstorming to get idea of the game. Research and study about the game idea will be done after getting the idea. A proposal will be prepared at the end of this stage.

2.4.2 Stage 2: Development

This stage includes the pre-production and production process. Game assets preparation will be done as well as the defining of the gameplay, game mechanics, user interface, and victory and termination condition during the process of pre-production. Design of the game world and implementation of code into the game will be done in process of production. Self-testing is also done during the code implementation to make sure that the code is run properly without errors.

2.4.3 Stage 3: Testing

A prototype will be created for the game to let game testers to test the game and get the feedbacks from them to find out and fix the bugs. This process may repeat a few times to make sure that there is no bug in the game. A final version of the game is deployed at the end of this stage.

2.4.4 Stage 4: Documentation

This stage involves preparation of final report and thesis of this project. Further research and study about the game will be done before the thesis writing. The facts of the research and study are then written into the thesis until the thesis is finished and submitted.