

**DEVELOPMENT OF STRATEGY CARD GAME WITH AUGMENTED  
REALITY TECHNIQUE**



**UNIVERSITI TEKNIKAL MALAYSIA MELAKA**



DEVELOPMENT OF STRATEGY CARD GAME WITH AUGMENTED  
REALITY TECHNIQUE

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

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY  
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2023

## DECLARATION

I hereby declare that this project report entitled  
**DEVELOPMENT OF STRATEGY CARD GAME WITH AUGMENTED  
REALITY TECHNIQUE**

is written by me and is my own effort and that no part has been plagiarized  
without citations.

STUDENT : TAN YONG SOON Date : 20/6/2023  
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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.

SUPERVISOR :  Date : 27/9/2023  
(Ts. SYARIFFANOR HISHAM)

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## ABSTRACT

This abstract section includes the concise overview of this project report, summarizing the objective analyses, finding throughout the research processes, the results obtained by the testing plan and briefly overview of this project. The primary objectives were to identify key features for designing a strategy card game with AR integration, implement AR techniques in the game development, and evaluate the effectiveness of AR integration. The testing phase involved two groups of participants, including both individual players and experienced game developers. The results of these testing which include technical test, functionality test and content test carried out valuable insights to this project. Technical testing identified areas for improvement in terms of performance, compatibility, and game flow. Content testing provided feedback on gameplay elements, story coherence, and user experience. Functional testing ensured all the game features worked as intended. Through the examination from the comprehensive testing and analysis, the project achieved its objectives. It successfully identified key features for designing an engaging strategy card game with AR elements. The implementation of AR technology enhanced the gameplay experience, immersing players in a unique gaming environment. The evaluation indicated positive feedback in terms of player engagement, AR integration and all the game features included. In short, this project achieved its objectives successfully, with solid proof by the testing and evaluation phases which provided valuable data and insights for improvement in game development.

## ABSTRAK

Bahagian abstrak ini mengandungi gambaran ringkas untuk laporan projek ini, merangkumi analisis objektif, dapatan sepanjang proses penyelidikan, hasil yang diperoleh daripada pelan ujian, dan ringkasan untuk projek ini. Matlamat utama adalah mengenal pasti objektif utama untuk reka bentuk permainan kad strategi dengan integrasi AR, mengabungkan teknik AR dalam pembangunan permainan, dan menilai keberkesanan integrasi AR. Fasa ujian melibatkan dua kumpulan peserta, termasuk pemain individu dan pembangun permainan yang berpengalaman. Hasil ujian ini termasuk ujian teknikal, ujian fungsionaliti, dan ujian kandungan memberikan pandangan berharga kepada projek ini. Ujian teknikal mengenal pasti bidang yang perlu diperbaiki dari segi prestasi, keserasian, dan aliran permainan. Ujian kandungan memberikan maklum balas mengenai elemen permainan, koherensi cerita, dan pengalaman pengguna. Ujian fungsionaliti memastikan semua ciri permainan berfungsi sebagaimana yang dijangkakan. Melalui pemeriksaan daripada ujian yang menyeluruh dan analisis, projek ini mencapai matlamatnya. Ia berjaya mengenal pasti ciri utama untuk reka bentuk permainan kad strategi yang menarik dengan elemen AR. Pelaksanaan teknologi AR meningkatkan pengalaman bermain, memberi pemain berada dalam persekitaran permainan yang unik. Penilaian menunjukkan maklum balas positif dari segi penglibatan pemain, integrasi AR, dan semua ciri permainan yang dimasukkan. Secara ringkasnya, projek ini mencapai matlamatnya dengan berjaya, dengan bukti kukuh daripada fasa ujian dan penilaian yang memberikan data dan pandangan berharga untuk penambahbaikan dalam pembangunan permainan.

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**LIST OF ABBREVIATIONS**

**FYP** - **Final Year Project**





**LIST OF ATTACHMENTS**

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## CHAPTER 1: INTRODUCTION

### 1.1 Project Background

Realm of Monster is an extended reality game that combines monster battling and turn based strategy game. By leveraging AR technology, the game provides an immersive and interactive experience that sets it apart from traditional card battling games. The project seeks to address AR technology with method turn-based card mechanics, and to research the element that provides enticing gameplay mechanics and graphic in several situation to determine which is the best way to enforce the technology.

### 1.2 Problem Statement

Augmented Reality (AR) technology has the potential to enhance the gameplay experience of strategy turn-based card games. However, as the existing technology is hard to fill the short by developing a game that integrates AR technology with strategy turn-based card game mechanics. Especially in terms of leveraging the graphic element that usually easy to bring out from pc component but when it comes to AR technology it will extend to another level of difficulty.

### **1.3 Objectives**

- (a) To identify key features in designing strategy card game with the integration of AR.
- (b) To implement AR technique in development of strategy card game.
- (c) To evaluate the effectiveness of AR integration in a strategy card game.

### **1.4 Goals and Genre**

There are several goals that needed to be achieved in this project. First, the project targets to enhance a game that thoroughly incorporates AR technological and turn-based card mechanics, presenting players with a unique and enticing gaming experience. Second, the challenge aims to create a collection of monster cards with special stats and abilities, thus player can play with various decks to manipulate the unique winning strategy. Third, the challenge seeks to plan an effortless and intuitive user interface that enhances the participant while navigating the game. Finally, the project creates balanced gameplay mechanics that provide fair gaming experience for all players.

### **1.5 Game Features**

The project's goals to ensure that the game is optimized for mobile devices such as Android and iOS to reach a wider audience. The target audience is set to Gamers aged 13-25 who enjoy augmented reality (AR) games, turn based strategy games, monster battling gameplay and fans of card collecting gamers.

### **1.6 Conclusion**

The project's initiative intends to give gamers who like both strategy games and AR related technologies a distinctive and interesting gaming experience. A variety of monster cards with distinctive stats and powers will provide user a refreshing and non-redundant gameplay. An easy-to-use UI, and balanced gaming mechanics will be

included in the game. In order to discover important features and design components that may be implemented into Realm of Monster, the project will comprise a literature analysis on the fields of augmented reality (AR) technology, monster-battling games, and turn-based strategy games.



## CHAPTER 2: LITERATURE REVIEW AND PROJECT METHODOLOGY

### 2.1 Introduction

Following is the overall literature review on this project. Augmented Reality is an advanced technology that has emerged as an innovative way to enhance the gaming experience based on few perspectives such as interaction, graphic, game mechanics and etc. This technology allows to bring the computer generate graphic to the real-world environment. It helps to create an immersive and interactive gameplay experience to the player. In this project, the relevant research will pinpoint how the AR technology can be incorporate to the monster battling game and identify the distinct improvement can bring along with the technology.

Turn based monster battle games have been around for decades, with example of hearthstone, Temtem, Monster Crown, and etc. Some of them even comes with famous title such as Pokémon and Digimon which already gain a lot of recognition in their movie series to attract large audience to play the game. Most of the monster battle game have the card collecting system and have complex game mechanic which involve a variety of monster skill, arenas effects, and gameplay that offer strong durability to the game itself.

### 2.2 Genre

In this project, a turn-based strategy game will be integrated with AR technology while game development process. Turn-based strategy as the main genre of this game determine players are going to have an asynchronous game style.

## 2.3 Existing Game

In game industry, game comparison is crucial to identify the strength and weakness of the game. It can help to pinpoint a specific area that can be improved in the game. On the other hand, it helps to understand the game features which can identify the game's uniqueness and how important those features carry a role in a part of the game.

Although AR monster battling games are not a popular series among gamers community nowadays. But that also means there is a potential opportunity for improvement. As the improvement of AR technology maturity, most of the game developer can combine a vivid graphic and existing game mechanic or even a more creative one to a single game that can make a game outstanding from the traditional game.

With that said, according to the recent market on Android and IOS mobile devices, there are several games outstanding from the genre of AR games and monster battling games. They are Pokémon go, Jurassic world alive, Dragon city mobile. And three of them will be the game comparison that conduct in this subchapter with table below.

### 2.3.1 Game Comparison

Table game comparison part 1 table include all the basic info of game comparison that allows us to determine the base requirement of the game pre-development progress.

**Table 2.1: Table Game Comparison Part 1**

	<b>Pokémon Go</b>	<b>Jurassic World Alive</b>	<b>Dragon City Mobile</b>
--	-------------------	---------------------------------	-------------------------------

<b>Platform</b>	IOS, Android	IOS, Android	IOS, Android
<b>AR Compatible framework in Android</b>	ARCore	ARCore	-
<b>AR Compatible framework in IOS</b>	ARKit	ARKit	-
<b>Required OS</b>	Android 7.0 or later iPadOS 14.0 or later. IOS 14.0 or later	Android 5.0 or later iPadOS 12.0 or Later IOS 12.0 or later	Android 5.0 and up iPadOS 10.0 or later IOS 10.0 or later
<b>Game Genre</b>	Fighting game	Fighting game	RPG fighting game
<b>Technology</b>	AR 3D game	AR 3D game	2D game
<b>Size</b>	400MB ++	1500MB++	256MB ++
<b>In app purchase average</b>	Rm1.9 – Rm479.9 per item	Rm4.99 – Rm509.99 per item	Rm4.9 – Rm699.9 per item

Table game comparison part 2 table include the technical based info of game comparison that allows us to determine the technical requirement in the game development process.

**Table 2.2: Table Game Comparison Part 2**

	<b>Pokémon Go</b>	<b>Jurassic World Alive</b>	<b>Dragon City Mobile</b>
<b>AR Capability</b>	Describe the transform of the Pokémon Present the location available to catch Pokémon Realistic demo in real-life monster battle	Present the location available Detect the exact location to catch Dinosaur	n/a
<b>Graphic</b>	3D interactive modelling	3D interactive modelling	2D animation character
<b>Camera Position</b>	3D transforms tracking area	2D and 3D transform tracking area	Platformer style viewing area
<b>Collectible card/ monster collection</b>	Yes	Yes	Yes
<b>Deck Building Style</b>	Catch from real-world. Enable GPS-tracking mode to spot the Pokémon available all around the world.	Catch from real-world. Enable GPS-tracking mode to spot the dinosaurs available all around the world.	Purchase from the game store. Get along game progression
<b>Battle type</b>	Versus AI controlled Enemy and PvP mode.	Versus AI controlled and scripted Enemy.	Versus scripted enemy and PvP mode.
<b>Game mechanic</b>	Presentation real-life location	Presentation real-life location Versus battle in terms of player's stat and ability	Versus battle in terms of player's stat and ability Deck Building