

**LOCATION-BASED ADVENTURE GAME TO ENGAGE TOURIST IN
DISCOVERING LOCAL LANDMARKS WITH DEEPAI**



UNIVERSITI TEKNIKAL MALAYSIA MELAKA



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LOCATION-BASED ADVENTURE GAME TO ENGAGE TOURIST IN
DISCOVERING LOCAL LANDMARKS WITH DEEPAI

TOH QI QI



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
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2021


DECLARATION

I hereby declare that this project report entitled
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DISCOVERING LOCAL LANDMARKS WITH DEEPAI**
is written by me and is my own effort and that no part has been plagiarized
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SUPERVISOR :  Date : 10 September 2021
(TS. SYARIFFANOR BT HISHAM)

DEDICATION

To my beloved parents.



ACKNOWLEDGEMENTS

I would like to thank my supervisor, TS. Syariffanor Binti Hisham and my evaluator, Professor Madya TS. Dr Norasiken Binti Bakar for giving assistant to complete this project successfully.

I would also like to thank my beloved parents and relatives who have supported and motivated me throughout my project.



ABSTRACT

This project is a treasure hunting game that requires real-time interaction with the real world. This game aims to understand the effectiveness of promoting and applying the art style of autistic students in real-life applications through a treasure hunting mobile application game. The present 2D adventure mobile game on the market lacks local Malaysian history. This initiative has the potential to aid our younger generation in gaining a better appreciation and knowledge of local history. Learning in-game also entice many gamers to learn history while having fun with the game. In this game, users have to find the correct answer and snap a photo of the answer's building. After that, the user can choose the art style created by autistic kids to transform that photo into a new style. Game Development Life Cycle (GDLC) is used to develop this project. GDLC has six phases. There are initiation, pre-production, production, testing, beta, and release. In the initiation phase, the idea and genre of the game are proposed. After the proposal is approved, pre-production research on the game idea, design, and levels. Development of the game is conducted in the production phase. Once the game is finished, the testing phase is carried out to test the game. Testing of the game is carried out on the targeted audience to check the game error and its efficiency. The correction is done after getting all the feedback. During the beta phase, a beta version is released for further testing. All the collected data or feedback are analyzed, and correction is done before releasing the final version. In the last phase, the release phase, the game's final version is released for evaluation and might as well be for marketing. The expected outcome of the game is research on the effectiveness of promoting the autistic kids drawing style to the real-world application through gamification. To summarize, this project achieved all the objectives proposed, and the results of the testing also show that overall, participants are satisfied with the game, but several improvements need to be made, such as the movement of the character in the mini-game is challenging to grasp and control.

ABSTRAK

Projek ini adalah permainan pencarian harta karun yang memerlukan interaksi nyata dengan dunia sebenar. Permainan ini bertujuan untuk meneliti keberkesanan mempromosikan dan menggunakan gaya seni pelajar autistik dalam aplikasi kehidupan sebenar melalui permainan aplikasi mudah alih harta karun. Permainan mudah alih pengembaraan 2D yang ada di pasaran tidak mempunyai sejarah tempatan Malaysia. Inisiatif ini berpotensi untuk membantu generasi muda kita dalam memperoleh penghargaan dan pengetahuan yang lebih baik mengenai sejarah tempatan. Belajar dalam permainan juga menarik sebilangan besar pemain untuk belajar sejarah sambil berseronok dengan permainan. Dalam permainan ini, pengguna harus mencari tempat yang betul dan mengangkapkan foto tempat tersebut. Selepas itu, pengguna boleh memilih gaya seni yang dibuat oleh kanak-kanak autistik untuk mengubah foto itu menjadi gaya baru. Untuk membangunkan projek tersebut, Game Development Life Cycle (GDLC) telah digunakan. GDLC mempunyai enam fasa. Terdapat inisiasi, pra-produksi, produksi, pengujian, beta dan pelepasan. Pada fasa permulaan, idea dan genre permainan dicadangkan. Setelah proposal disetujui, penyelidikan mengenai idea permainan, reka bentuk dan tahap permainan dilakukan pada fasa pra-produksi. Pengembangan permainan dilakukan dalam fasa pengeluaran. Setelah permainan selesai, fasa pengujian dijalankan untuk menguji permainan. Pengujian permainan dilakukan pada khalayak yang disasarkan untuk memeriksa kesalahan permainan dan juga kecekapannya. Pembetulan dilakukan setelah mendapat semua maklum balas. Selama fasa beta, versi beta dikeluarkan untuk pengujian lebih lanjut. Semua data atau maklum balas yang dikumpulkan dianalisis, dan pembetulan dilakukan sebelum melepaskan versi akhir permainan. Pada fasa terakhir, fase pelepasan, versi akhir permainan dirilis untuk penilaian dan mungkin juga untuk pemasaran. Hasil permainan yang diharapkan adalah penyelidikan mengenai keberkesanan mempromosikan gaya menggambar kanak-kanak autistik ke aplikasi dunia nyata melalui gamifikasi. Kesimpulannya, projek ini mencapai semua objektif yang dinyatakan dan hasil ujian juga menunjukkan bahawa keseluruhan peserta berpuas hati dengan projek ini tetapi mempunyai beberapa penambahbaikan perlu dilakukan seperti pergerakan watak dalam permainan mini sukar untuk dikawal..

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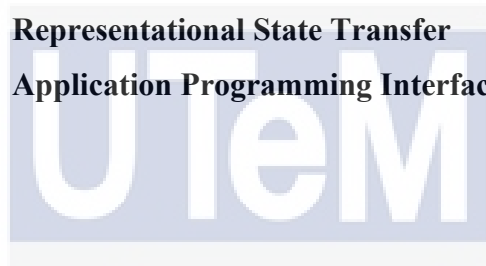
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LIST OF ABBREVIATIONS

DEEPAI	-	Deep Artificial Intelligence
GPS	-	Global Positioning System
SDK	-	Software Development Kit
UI	-	User Interface
GUI	-	Graphic User Interface
REST	-	Representational State Transfer
API	-	Application Programming Interface



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CHAPTER 1: INTRODUCTION

This project aims to develop an android application game to promote Melaka and applying the art style of autistic students to real-life applications through treasure hunting mobile application games.

1.1 Project Background

Geocaching Melaka is an adventure 2D mobile game that requires real-time interaction with the real world. The game's storyline applies the concept of a short-term repeatable background story (citation author, year). The famous examples of the game which use this technique are subway surfer, temple run, and fruit ninja. In this game, the story set on Alice is an apprentice of an archaeologist named John. However, John was found missing when investigating Melaka's history in Malaysia. Alice searches high and low for her teacher John and found a suspicious map with a hidden clue about her missing teacher in a safe box underground of her teacher's house. Hence, the adventurer of an apprentice begins.

1.2 Problem Statement

Malaysia's unique history is rarely used as content in the commercial 2D mobile game application. Therefore, the Malaysian younger generation tends to lack understanding and appreciation towards the local history of multi-ethnic communities in Malaysia. Therefore, it hoped that this game would encourage the Malaysian younger generation to learn history while having fun with the game.

1.3 Objectives

- To explore geosocial and Geocaching services in the tourism app.
- To implement a Global Navigation Satellite System (GNSS) to navigate the user to the correct location.
- To integrate style transfer REST-API services with the Tourism Gamification mobile application.

1.4 Goals and Genre

This project aims to develop an adventure game for tourists with the integration with DeepAI technology. This game aims to research the effectiveness of promoting and applying the art style of autistic students in real-life applications through treasure hunting mobile application games.

The genre of the game is adventure 2D mobile game. 2D mobile game is a game that proceeds the game or the story by moving along with the mobile. In the application, a mini-game requires the user to control the character and move around the screen to avoid obstacles and collect the Tricycle to accumulate scores for unlocking clues to the next phase.

1.5 Game Features

The target audience is primarily youths, which in this context means those above 18 years old. Youths are chosen because most of the tourism range around 18-40. The game has three open levels and one lock level. Each level consists of a mini-game, image clue, GPS location, image capturing, and DeepAI style transformation. Meanwhile, different map layouts are introduced in each of the mini-game.

The rules of the game are straightforward. First, the player needs to play the game to accumulate the score to unlock clues. The clues will help the player to find the hidden location.

1.6 Conclusion

In conclusion, this chapter is about the background, problem statement, objective, genre, and game features. Then, an explanation of each part is discussed in detail. This project aims to develop an adventure game for tourists with the integration with DeepAI technology. The next chapter, Chapter 2, will be on the Literature Review and Methodology used in the project.



CHAPTER 2: LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

This chapter will be on literature review. The game genre and project methodology will be explained in detail. Existing games will be discussed as well as compared with the game in this project. Discussion on the past research or findings will also be discussed in this chapter.

2.2 Genre

The game genre for this project is a 2D adventure game. This game consists of stories and mini-games. The mini-game has a scoring system that will be used to unlock the clues given by that place. The player needs to control the character to avoid the obstacle and collect the Tricycle item in the mini-game.

2.3 Existing Games

A few similar games have been developed, such as Geocaching, Treasure-HIT, Treasure Hunt, Ocean Game, etc. These games were developed with the purpose of promoting the activity of Geocaching. As for this project, Geocaching Melaka is developed to promote and apply the art style of autistic students in real-life applications through treasure hunting mobile application games.

Treasure-HIT is similar to the existing game, Geocaching which promotes the activity of Geocaching and GPS usage. Treasure-HIT is to learn about its history and geography and be aware of the local sites of interest.

The target audience for Geocaching is voluntary participants, while the target audience for Treasure – HIT is teachers and students. Teachers create and control the activities, and the player(student) plays the game. Besides that, the technology implementation in both games is GPS and mobile platforms.

Furthermore, the gameplay of Geocaching is hiding & seek containers to find the hidden geocache. Besides that, Treasure-HIT gameplay attaches clues that direct the players to the location and offer specific activities for each location.

2.3.1 Comparison of Existing Games

As mentioned in 2.3 Existing Game, there have a few similar games have been developed. The table below shows the comparison of the current game and the existing game.

Table 2.1: Comparison of the current game and existing game

No	Name of the project	Target audience	Purpose of project	Mechanic/ gameplay	Technology behind it
1	Geocaching	Voluntary participants	To give the US military advantage with GPS hardware, to promote Geocaching and GPS usage.	Hide & seek container, finding the hidden geocache.	GPS, mobile
2	Treasure-HIT	Teacher and student. Teachers create and control activities, and players (students) play the game.	To familiarize students with their close vicinity, learn about its history and geography, and be aware of the local sites of interest.	Attach clues that direct the players to the location and offer specific activities for each location	Mobile, Google Maps, and Google Street API

3	Treasure Hunt	8 – 12 years old children who are in cognitive-behavioral treatment for various disorders.	This game has including therapeutic concepts into game. Children can be offered attractive electronic homework assignments that enable them to rehearse and repeat basic psychoeducational concepts they learned during therapy sessions.	This game is an interactive adventure game with six levels. Each of the six levels of the game corresponds to a specific step in cognitive-behavior treatment. The maximum amount of time needed to solve all tasks of a level is about twenty minutes.	Treasure Hunt is a 2.5D Flash adventure game programmed with an Action script and XML.
4	Ocean Game	9 – 10 years old students	To fuse engagement and entertainment by offering a gaming experience in line with the learning goals of the museum.	A treasure-hunt-based mobile game for the player to search and collect a plethora of marine animals and learn about their key characteristics in the context of the Natural History Museum of Funchal (NHMF), Portugal.	Mobile interactive technology in museum settings

5	Museum Treasure Hunt	11-14 years old students	Education game exploits graphics and interaction both for gaming and for learning. Students can be further intrigued by using objects and equipment they are familiar with, yet unanticipated ways.	The player has to search for the "materializations" of the solution to a sequence of riddles and photograph them by personal camera phone.	QR code, mobile
6	The potential of treasure hunt game to generate positive emotions in learners: experience local geography and history using GPS device	2 nd and 4 th class pupils in the centrally located school in Pori, Finland (110 students)	To study findings, demonstrate that the children reported the most positive experiences of this treasure hunt game.	Children's interactions using letterboxing and geocaching treasure hunt games as a creative pedagogical design where technology was exploited to solve clues.	GPS
7	Treasure Hunt with Intelligent Luminaires	Voluntary participants	To create a situation-aware real-time control system that adapts automatically to person behavior in ambient space.	Monitor and track people's behavior are getting more common. At the same time, novel lighting controls the LED technologies allow real dynamic	A treasure hunt game uses depth sensor-based people tracking service, wirelessly controlled RGB LED, and a light controlling unit where LED bulbs change their

				time controlling of the illumination systems.	color according to position and movement in a room.
8	H-Treasure Hunt	Any visitors	This game act as a tour guide, helping users learn about the historic site and artifacts.	Players wear Head Mounted Display (HMD) and explore a historic site interacting with artifacts to complete the mission.	GPS, Head Mounted Display (HMD)
9	Snap2Play	25 -40 years old people	This game is to deploy and evaluating of a mixed reality location-based mobile treasure hunt.	They are using technologies such as place recognition, accelerometers, and GPS tracking for enhancing the interaction with the game and, therefore, the game's playability.	Mixed Reality, the mobile phone that including cameras, GPS, orientation sensors, tactile surfaces, and vibrotactile display
10	Code Hunting Games	Member of the CodeMOOC community	The proposed system transposes the classical scheme of "treasure hunt" games into a mixed-reality game, where players must physically	An online multiplayer game that challenges players with abstract coding puzzles that are tied to a geographic location.	Multiplayer, chatbot, online, mobile.