SCAN-ME: A PROTOTYPE OF AUGMENTED REALITY PAPER MAP IN PENANG

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This report is submitted in partial fulfilment of the requirement for the Bachelor of Computer Science (Media Interactive) With Honours

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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 Computer Science (Interactive Media) With Honours.

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DEDICATION

This project is dedicated to my family who have always been there for me whenever I need and always give me advice to do the best in everything.

This project also dedicated to my supervisor, Dr. Ibrahim bin Ahmad who have guided me with great attention and motivated me to set a higher goal to produce a better project.

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ABSTRACT

In effort to attract higher tourist expenditure along with higher tourist arrivals, this paper proposes a tourist application called the SCAN-ME , which operates by making recommendations to user based on the travel objective and individual budget constraints. The applications relies on augmented reality technology, whereby a three dimensional model is presented to the user based on input from real world environment. This project was developed using Autodesk Maya, Unity, and Vuforia. By developing this application, tourist enriches the real-world with interactive virtual information that allows visitors to unfamiliar locations to identify the most important and interesting points of interest and learn more about their surroundings. User testing returned a favorable feedback on the concept of using augmented reality in promoting Malaysian Tourism especially in Penang. The scope of this project are for visitor .The target user of this application are the tourist who come to Penang for holiday. The objective of this project are to study an application which uses paper maps as base map and overlaying digital information which is accessed through a mobile device .Besides, to develop an AR Technology in tourism that can interact the real and virtual object and to evaluate easy access to information and reliable. This project use Waterfall Model. The Waterfall Model illustrates the software development process in a linear sequential flow; hence it is also referred to as a linear-sequential life cycle model. This means that any phase in the development process begins only if the previous phase is complete. In waterfall model, there is no overlapping in the phases. This application gives more attractive information to tourist and will helps them to understand more about places in Penang.

ABSTRAK

Dalam usaha untuk menarik perbelanjaan pelancong yang lebih tinggi bersama-sama dengan kedatangan pelancong yang lebih tinggi, kertas kerja ini mencadangkan sebuah aplikasi yang dipanggil SCAN-ME, yang beroperasi dengan mencadangkan kepada pengguna berdasarkan objektif dan kekangan bajet individu. Aplikasi ini bergantung kepada teknologi realiti, di mana model tiga dimensi (3D) yang dikemukakan kepada pengguna berdasarkan input daripada persekitaran dunia sebenar. Projek ini telah dibangunkan dengan menggunakan Autodesk Maya,Unity dan Vuforia. Dengan membangunkan aplikasi ini, dapat menunjukkan dunia sebenar dengan maklumat maya yang interaktif dimana membolehkan pengunjung ke lokasi yang baru.Untuk mengenal pasti perkara yang paling penting dan menarik minat dan mengetahui lebih lanjut mengenai persekitaran mereka. ujian pengguna kembali maklum balas yang baik ke atas konsep menggunakan realiti diperkukuhkan dalam mempromosikan Pelancongan Malaysia terutama di Pulau Pinang. Skop projek ini adalah untuk pengunjung .Sasaran pengguna aplikasi ini adalah pelancong yang datang ke Pulau Pinang untuk bercuti. Objektif projek ini adalah untuk mengkaji sebuah aplikasi yang menggunakan peta kertas sebagai peta asas dan melapisi maklumat digital yang diakses melalui aplikasi .Selain itu, peranti mudah alih, untuk membangunkan Teknologi AR dalam pelancongan yang boleh berinteraksi objek sebenar dan maya dan untuk menilai mudah akses kepada maklumat dan boleh dipercayai. Projek ini menggunakan Waterfall Model dimana menggambarkan proses pembangunan perisian dalam aliran berjujukan linear; oleh itu ia juga dirujuk sebagai model kitaran hayat linear-berjujukan. Ini bermakna bahawa mana-mana fasa dalam proses pembangunan bermula hanya jika fasa sebelumnya selesai. Dalam model ini, tidak ada pertindihan dalam fasa. Aplikasi ini memberikan maklumat lebih menarik kepada pelancong dan akan membantu mereka untuk memahami lebih lanjut mengenai tempat-tempat di Pulau Pinang.

TABLE OF CONTENTS

LIST OF TABLE

LIST OF FIGURE

LIST OF ABBREVIATIONS

3D	**-**	**Three Dimensional**
AR	**-**	**Augmented Reality**
GPS	**-**	**Global Positioning System**
JRE	**-**	**Java Runtime Environment**

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

1.1 Introduction

Augmented reality (AR) is a variation of virtual environments (VE), or virtual reality as it is more commonly addressed. This study is concerned with the supplementation of a live view of physical real-world environment where the features are augmented by virtual computer generated imagery. Viewing AR as a concept rather than a technology is more productive (Hsin-Kai Wu *et al.* , 2013) by using AR, an application is designed inside your tablet which is similar to the live view of the physical world. The objective of this study is to review related literature that could highlight several significant knowledge gap for new exploration of AR study. The content analysis method was used in analyzing the literature. An effective AR system must be built with real-time performance in mind and accurate timestamps must be available. Users are experiencing reality so believability is easier to achieve. The application using augmented reality technologies to share the information about places in Penang. This application must be simple to use. Scan targeted paper maps and allow for an information to be told. The problem statement is provide vast amount of information and alternative modes of services in a compact form .Limited display size of the smartphones causes inconveniences for map & information display. The project

title is Tour Paper Maps in Penang .Its will be using augmented reality to allow for an information to be appear in phones.

The advances in communication networking for mobile phones are considered the main cause of the emergence of some services that can easily present sightseeing information through the mobile at the tourist places. Nevertheless, the contents of the current tourist guide like the web and guide books present data and information that are related to non-activated sightseeing. This application system enables users to easily see data and information via utilizing their mobiles.

1.2 Project Background

This project is to develop the application based on augmented reality technology.This project is to develop the application which can helps tourist to trvel better at Penang.The propotytype will be develop by using augmented technology technology where it will combine with 3D model to make this project more interesting.

Current maps are exhausting and old. Along these lines, they absence of collaboration between the interactive and media What's more, to build up the intelligent media discovering that will be completely communicate with the user, so the apllication combine with information and media with 3D image will be develop.

1.3 Problem Statement

The advances in communication networking for mobile phones are considered the main cause of the emergence of some services that can easily present sightseeing information through the mobile at the tourist places. Nevertheless, the contents of the current tourist guide like the web and guide books present data and information that are related to non-activated sightseeing such as user do not see the real situation or

environment before .This application system enables users to easily see data and information via utilizing their mobiles.

1.4 Objective

Based on the aim of this project to increase the number of tourist to come to Penang and also to understand more about places in Penang , the objective of the project must state clearly. The objectives of this project are:

a) To study an application which uses paper maps as base map and overlaying digital information which is accessed through a mobile device

b) To develop an AR Technology in tourism that can interact the real and virtual object

c) To know user and expert opinion about the design of "SCAN-ME" prototype.

1.5 Scope

a) Target User

A target audience, is formed from the same factors as a target market, but it is more specific, and is susceptible to influence from other factors .The target user for this application are the tourist that have holiday in Penang.

b) Contents / Modules

SCAN-ME is selected and created by using 3D compositing software. Then a paper maps will be created and the image at the maps will be the target for the augmented reality application. A modeled 3D will appear at the tablet's or phone

screen when the application the target image. This application is a stand-alone application that runs using android.

1.6 Project significant

The significance of this project are this application will help tourist to understand more about the place in Penang. Additional interactions through this application will improve the attractive of the existing paper map. So, the attraction from tourist about maps can be improved when using this application. As the results, the application will tourist more interesting and learn more about Penang. Tourism enriches the real-world with interactive virtual information that allows visitors to unfamiliar locations to identify the most important and interesting points of interest and learn more about their surroundings. This application will also help Tourism Department to attract more visitor to come to Penang.

1.7 Summary

As a summary, this project gives more attractive information to tourist. This chapter explains about the project overview, problem statements, objectives, scope, project significance and project significance. This chapter states the overall understanding of this project. The next chapter will discuss the literature review for this project.The literature will discuss about the technology of augmented reality and existing application.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Scholars and researchers define literature review as the piece of work related to a topic that has been published. It usually is part of the introduction to a research report, essay or thesis. Conveying the knowledge and ideas of the established topic is the purpose of conducting a literature review. Literature review, as a piece of writing, it must be led by a guiding concept and it is not just a set of summaries or summaries descriptive list of the available material (Dena Taylor, 2008). The ability to review, and to report on relevant literature is a key academic skill. A literature review will situates a research focus within the context of the wider academic community in a topic, identifies a gap within that literature that s research will attempt to address and reports the critical review of the related literature (SSDS, University of Leicester, 2010).

In this chapter, the literature review will be conducted and discussed. The area of research in this chapter will involve the benefit of augmented reality, the comparison between the existing games.

2.2 Domain

Current maps are exhausting and old. Along these lines, they absence of collaboration between the interactive and media What's more, to build up the intelligent media discovering that will be completely communicate with the user, the area of the venture will be spotlight on media discovering that will utilize Augmented Reality (AR) as its execution.

Viewing AR as a concept rather than a technology is more productive (Hsin-Kai Wu *et al* . ,2013). Through AR framework, clients will see the picture in media learning as the continuous environment that will be expanded with 3D representation. To make a legitimate adjust between continuous environment and illustrations. Student motivation increase when using augmented reality (Angela Di Serio *et al.* , 2013)

2.3 Existing Application

Current maps are exhausting and old. Along these lines, they absence of collaboration between the interactive and media What's more, to build up the intelligent media discovering that will be completely communicate with the clients, the area of the venture will be spotlight on media discovering that will utilize Augmented Reality (AR) as its execution.

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2.3.1 Pokemon Go

Figure 2.1 shows the augmented reality which implemented in this mobile application.

Figure 2.1 Pokemon Go

Niantic's Pokémon Go, a game that has quickly captured everyone's attention and given them a reason to go out into the world, walk around, and catch Pokemon. The game uses GPS to mark your location, and move your in-game avatar, while your smartphone camera is used to show Pokemon in the real world. For the most part, it works, provided the game hasn't crashed or frozen. There aren't a lot of instructions when you first start, or information regarding game mechanics like the colored rings around wild Pokémon, but thanks to the nature of the internet, figuring out what to do isn't that tough.