FACTOR POTENTIAL IMPLEMENTATION OF AUGMENTED REALITY (AR) AMONG DEVELOPER IN MALAYSIA.

NUR RABIATUL ADAWIYAH BINTI HASIM

B. ENG(HONS.) CIVIL ENGINEERING

UNIVERSITI MALAYSIA PAHANG

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I/We* hereby declare that I/We* have checked this thesis/project* and in my/our* opinion, this thesis/project* is adequate in terms of scope and quality for the award of the Bachelor Degree of Civil Engineering

_____

(Supervisor's Signature)

Full Name : ZAHRIZAN BIN ZAKARIA

Position : Lecturer

Date : 25 June 2018

_____

(Co-supervisor's Signature)

Full Name : -

Position : -

Date : -

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I hereby declare that the work in this thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Malaysia Pahang or any other institutions.

_____

(Student's Signature)

Full Name : NUR RABIATUL ADAWIYAH BINTI HASIM

ID Number : AA14013

Date : 25 June 2018

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NUR RABIATUL ADAWIYAH BINTI HASIM

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ABSTRAK

Augmented Reality (AR) adalah teknologi baru yang terletak di antara dunia maya dan sebenar yang dihasilkan oleh komputer. Ianya mungkin tidak begitu seperti menarik realiti maya seperti pengalaman menaiki rollercoaster namun realiti tambahan ini mempunyai unsur yang membawa unsur maya ke dunia nyata meningkatkan object yang kita lihat, dengar dan rasakan. Melalui pembacaan daripada pelbagai sumber seperti jurnal,website mahupon buku-buku, AR di dalam industri Malaysia sedikit ketinggalan berbanding negara maju lain dalam aspek pengetahuan kerana kurang pendidikan dan pendedahan mengenai AR. Kertas kerja ini adalah untuk mengkaji potensi pelaksanaan faktor Reality Augmented dalam kalangan pemaju di Malaysia. Objektif pertama kajian ini adalah untuk mengkaji penggunaan aplikasi AR di Malaysia dalam model pemodelan. Objektif kedua adalah untuk mengenal pasti potensi faktor pelaksanaan AR. Objektif ketiga akan menyumbang kepada hasil kajian ini adalah untuk menganalisis potensi faktor yang paling mempengaruhi pelaksanaan penggunaan AR untuk pemodelan rumah. Kajian kaji selidik dijalankan untuk mendapatkan objektif yang soal selidik diedarkan kepada responden secara rawak dengan latar belakang yang berlainan. Soal selidik mempunyai 5 segmen mewakili setiap potensi kemungkinan pelaksanaan AR yang merupakan visualisasi, kos, masa, pengetahuan, perisian dan alatan (smartphone). Data dianalisis dengan menggunakan kaedah analisis RII. Hasil analisis tersebut mendapati faktor yang paling mempengaruhi untuk melaksanakan AR dalam industri pemaju ialah faktor visualisasi oleh AR. Hal ini demikian keran, model 3D yang dipamerkan melaui telefon pintar mereka menjadikan pengalaman menggunkan AR merek menjadi lebih menarik malah pemahaman mereka mengenai sesebuah model rumah lebih meningkat.

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ABSTRACT

Augmented Reality (AR) is a new technology that lies between virtual and real world as it computer-generated. It may not be as exciting as a virtual reality such as rollercoaster ride however augmented reality has element which brings out virtual element into the real world enhancing things we see, hear and feel. Based on the literature exploration, AR in Malaysian industry a bit behind compared other develop country in aspect knowledge due to lack knowledge. This paper are to study the factor potential implementation of Augmented Reality in developer. The first objective of this study is to study AR applications uses in Malaysia in modelling building. The second objective is to identify the potential factor implementation of AR The third objective which is will contribute to the outcome of this study is to analyse the most influence factor potential of implementation AR usage for house modelling. Questionnaires survey was carried out to gain objective which the questionnaires are distributed to random respondent with different background. The questionnaires have 5 segments represent each possible factors potential implementation of AR which is visualization, costing, time, knowledge, software and hardware. Data are analyzed by using RII analysis method. In coherent result obtained, the most influence factor to implement AR in developer industry is visualization produce by AR by reason of interest 3D model display on their smartphone devise by reason of respondent able to engaged with the house design further than viewing the 2D floor plan even more interesting and immersive way in AR technology.

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF SYMBOLS

RII	Relative Importance Index
Pi	Respondent's rating
Ui	Number of respondents placing an identical weighting/rating
W	Sample size
N	The highest attainable score

LIST OF ABBREVIATIONS

AR	Augmented Reality
BIM	Building Information Modelling
3D	Three-dimensional

CHAPTER 1

INTRODUCTION

1.1 Introduction

Augmented Reality (AR) is a new technology that lies between virtual and real world as it computer-generated. It may not be as exciting as a virtual reality such as rollercoaster ride however augmented reality has element which brings out virtual element into the real world enhancing things we see, hear and feel. The origin word of Augmented Reality is to add something. It referring to add something virtual into to the real world including sounds, graphic and touch feedback. AR is different with Virtual Reality which totally changed the world of the surrounding. The surrounding world of the user become becomes interactive and digitally manipulable with the help of advanced AR technology. Google companies are among the earliest companies that introducing AR technology using Google Glass but their attempt are failed to market. The world once again in 'shock' with the emergence of Pokemon GO which it brings AR to mass audience. It is the first free smartphone game which the players need to capture exotic monster from Pokemon cartoon where it need combination uses of technologies build in smartphone such as camera, maps, location tracking. It means that AR has layers of information to performance where the information about the environment and its object overlaid on the real world. After the mainstream shock of AR experiences in entertainment and game industries, other business industries also seek for opportunities in AR's possibilities for example in knowledge sharing, managing the information flood, modelling, educating and organizing distant meeting.

1.2 Background of Problem

Augmented reality (AR) enhances one's current perception of reality, whereas in contrast, virtual reality replaces the real world with a simulated one. Augmented reality

is used in order to enhance the experienced environments or situations and to offer enriched experiences. AR is functional to present the nD information of BIM, at the same time retaining users' connection with the reality. It is not just being utilized solely for presentation, but also to maximize the potential for communication, interaction and experience (Lee et al. 2016).

A project can be showcased to buyers or customers in 3D using augmented reality applications. AR technology give new approaches in showcase of a project which is not required costly transportation to set up a presentation spaces to the public. In addition, AR technologies may increase the potential outcome since it help to overcome the geographical barriers and reach out more potential customers. Thus, it reduce cost in term of marketing and conversion from 2D to mockup scale model. In the same time, it save cost printing services of brochure, costly ad, and hotel expenses and reduce travelling. Using AR in viewing the model may give the user great experience which it pilot the user to walkthrough the model and gain information about the building. The buyers may visualize the arrangement of furniture, color of the building and the material of the element. All these criteria are consideration that may influence their decision making since it may influence their surrounding of him and his family.

The developer company will usually produce a 3D scale model building to be displayed to the buyer or investors after the external design is made by the architect. 3D scale model is helpful for showing a tangible representation of your project before development begins. Investors or decision makers involved in the project will appreciates being able to see just how the building looks, the layout of the rooms, the architectural elevation and more.

Since every project is unique in size and details, the scale model does not have standard price quote and turnaround time. The smaller project typically take two to three weeks to complete while the larger model may take a month or more. Their complex and details process need skill person from decide scale needed to be used into cutting the material to produce scaled model. In mean time, the material needed such as cardboard, wooden blocks, polystyrene and other material are costly. The scale model is hard to carry or move anywhere to be displayed to the public as it needs the precision to move to take it and needs space to be showcase. Other than that, scale model only give the physical view of the building neglecting the information of the building such as the material, color

and the view are limit since scale model are too small to view details. This limitation may influence the decision making made by the buyers because sometimes not a good scale model may affected the 'image' of good building.

The 3D model gives an overview of a house where it is necessary to visit a housing exhibition physically in order to understanding about the house. Many real estate take an approach by uploading video of architect early picture of the house and floor plan on their website in the internet. Thus, people no need to attend the house exhibition order to get the view an information of the house. However, the picture of a house may not be able to achieve the home buyers understanding because some of it may not have the technical skills to interpret the information provided such the size of the house, the area or even the symbols in the floor plan.

1.3 Problem Statement

Augmented reality (AR) is a new technology that has emerged with potential for application in constructions and architectural through portable displays such as tablets and smartphones, opens up new expectancy for project planning and management (Sapry, 2017). The capabilities AR may open up to new potential in house marketing in developers. However, application in AR in Malaysia are still slow especially in architectural field and many companies apply traditional approach; 3D/prototype model.

The prototypes model are built as it for client overview about a house or building which is it is physically construct in small size. Nevertheless, prototypes model need physically view and it merge difficulties in term of distance and time for certain client or client whom visit in their websites.

There are several factor potential implementation of AR in Malaysian developers that may contributes to industry to study and invest in this new technology. Research factor potential implementation somehow may lead into progressive involvement for Malaysian developers to invest and implement AR in their company.

1.4 Objective

The objective of this study is:

i. To study AR application uses in Malaysia in modelling building.

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