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Kampong Bharu AR

Preservation of Kampong Bharu: Augmented Reality Mobile Application for Visitors

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Abstract— **AR is an emerging technology that enables people to experience a whole new world through their smartphones. This technology can be utilized for various industries such as education, gaming, and tourism. This Augmented Reality (AR) application is suitable for all ages and makes it easy for tourists to find out more about Kampong Bharu. The waterfall model is used in this research, which includes Requirements, Analysis, Design, Implementation, Testing, Deployment, and Maintenance. The focus of this research is to figure out how to make it simpler and more participatory for visitors to learn about and describe Kampong Bharu. As a result, the findings indicate that tourists will alter their typical mode of transportation before or after the trip. This Augmented Reality (AR) software will assist travellers in making decisions on their route to Kampong Bharu. Visitors have a great opportunity to explore the Kampong Bharu region since Augmented Reality (AR) applications make it simple to obtain information.**

Keywords—Augmented Reality, tourism, explore, Kampong Bharu

I. INTRODUCTION

Due to the increasing awareness of augmented reality, it has become widely used in various industries. The definition of Augmented Reality is a technology that merges the real and virtual worlds, which means that real-world items are enhanced with computer-generated perceptual knowledge, frequently via multiple sensory techniques. The most amazing aspect of Augmented Reality is that it frequently employs the notion of 3D imaging. In Augmented Reality, the video may also be utilised as a concept.

In the research, Augmented Reality is enjoyable to use and enhance method because its incorporation into 3D makes it highly appealing. This application is a must-have for tourists wanting to visit Malaysia. It can be used to reference points when travelling to other countries. Using a book or pamphlet as a guidance is a more practical approach since it soothes tourists and offers them a sense of confidence when travelling. The main issue with this type of handbook is that its contents are rarely updated. Many of the greatest businesses and tourist attractions, for example, were nearby or on their way to other destinations. It will take a long time to update the contents of the handbook. Keeping material up to date is also nearly impossible after a one-year update procedure (Rashid, January,2017).

The complexity and multidimensional nature of the visitor Experience make it difficult for tour guides to work effectively. Which has a very strong effect on the physical environment, more rarely on social background, and rarely on personal history. Kampong Bharu continues to find new ways to enhance the visitor experience, such as studying conventional methods in showcasing exhibitions and information and expanding current practices (Marques, 2017). In addition, compared to live screenings, the use of augmented reality technology can also be used to promote historical monuments and teaching methods.

II. LITERATURE REVIEW

A. *Structure of a typical AR assembly system*

In today's information and technology age, most companies focus on computers and mobile applications. According to (QIU, 2019), Augmented Reality is more likely to transmit computer software models or information to the physical environment. This integrates a virtual universe model with the actual world around the user, as well as VR, to grasp the connections between the real and virtual worlds and to reduce the repeated scene modelling

and rendering activities connected with VR. Teaching data for installation (annotations, animations etc.). Other aspects should be considered besides developing 3D data formats and conversion methods suitable for AR applications. The method is to use the ISO 10303 (ISO 10303) specification to express product data. However, there is a lack of semantics to represent AR-type information (SaSsk, 2008). All system components offer topological inputs, and the control panel quickly recognizes line configurations (Elmaraghy, 2016). AR enhances the interaction between the system and the user by encouraging them to roam the AR world and routinely command things. AR enhances the interaction between the system and the user. As a result, AR systems have emerged as one of the most promising ways to improve the mechanical assembly process. Further, for each key functional element, such as a monitor or video, a pop-out note describes the features, weaknesses and ratings. Six coloured kernel modules, such as the blue input data path and the orange output data route, rely on critical data transfer channels (Wang,2016).

B. Augmented Reality in Education

Augmented Reality technology broadens human sensory experience in a variety of ways by blurring the line between real-world and computer- generated elements. (Byeongki Jeong, Janghyeok Yoon, 2017). Using virtual goods to present information that the user cannot immediately observe with his own senses enables a person to communicate with the real world in previously unimagined ways. The researcher may modify the location, shape, and other graphical properties of virtual objects using Augmented Reality interaction techniques (Mehmet Kesim, Yasin Ozarslan, 2012). The distance between students at a table is used to send communication cues such as looks, gestures, and nonverbal movements. The task-space is a subset of the communication space if individuals talk about things on the table. The collaboration will see each other and signal mutual contact at the same time with the object they are aiming for (Billinghurst, 2002). Furthermore, visitors to Kampong Bharu may use their smartphones to access AR and find object-related historical content. Additional information about what people see, though not all Kampong Bharu locations and landmarks can afford this owing to space or economic constraints. When Augmented Reality becomes more widely available, the Kampong Bharu region will benefit greatly. The advantage is that travellers may already access Augmented Reality via mobile devices (Reddy, 2020). While the full potential of merging smartphones with Augmented Reality for education has yet to be

realised, it is astounding. Augmented reality may provide pupils with expanded digital knowledge about any subject and make complicated material easier to learn in a variety of ways (Sivakumar, 2020). It's fascinating that students discovered that, in contrast to the traditional way, AR improves the design process but not the finished product. The researcher think this is because students believe that even if they can acquire the same design without AR, the way to get there with AR might be better (Sánchez, 2010).

C. Case Study

1) Wanna Kicks

Figure 1: Wanna Kicks

Wanna Kicks is the application's footwear endeavour, where user can use augmented reality to explore new releases and iconic shoes. Regardless matter where users are, try to kick your feet instantly and then snap a picture to surprise your buddies.

2) Pokemon Go

Figure 2: Pokemon Go

Pokémon Go is a free mobile application that incorporates real-world gameplay with Pokémon. The game employs location tracking and mapping technologies to generate 'extra worlds' in which players may capture and train actual Pokémon creatures. To play the game, users must be at least 13 years old.

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III. METHODOLOGY

The methodology was the procedure through which the study was carried out. The methodology was based on the WATERFALL Model, which comprises of Requirement, Analysis, Design, Implementation, Testing, Deployment, and Maintenance.
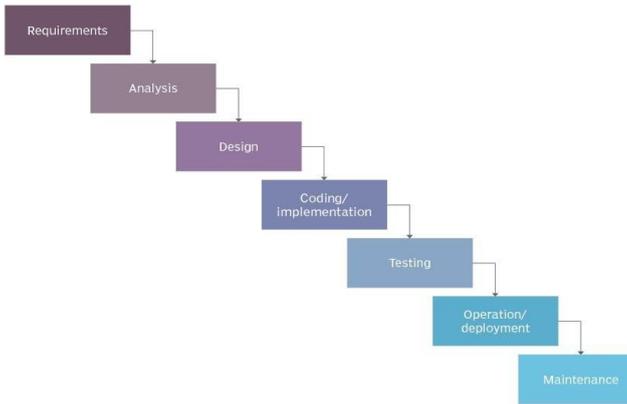

Figure 3: Waterfall Model

1) Requirement Phase

Phase 1 basically research on what designs and functions the need to be understand before start of the project. Here, input and output specifications or the final product are reviewed and marked. In this process, the problems involved with the project will be researched and identified. The scope and objectives of the project will also be emphasized in this phase.

2) Analysis Phase

During this step of the study, the software that must be used will be examined. Unity, Microsoft Visual Studio, and 3ds Max are just a few examples of tools that can be used to create Android smartphone apps. Unity from Microsoft Visual Studio and 3ds Max was used to provide the platform for the creation of Android applications for this project.

3) Design Phase

This Phase of development encompasses both hardware and software design. The hardware design is primarily concerned with the creation of the interface that will be utilized to implement the hardware in this project. Smartphones and locations, for example, are activated. Its design focuses on producing Augmented Reality for Unity-made applications, as well as 3D models in 3ds Max and information design in Microsoft Visual Studio.

4) Implementation Phase

Using the Visual Studio platform, prototype framework for Android smartphone users being involved in this implementation procedure. All the hardware and software requirements will be necessarily installed.

5) Testing Phase

One of the important Phase in this project evaluation because it determines whether the objectives and criteria required meets with the project efficiently or not. The component of testing in this Phase involves testing the prototype on the Android platform, evaluating device connectivity, and ensuring that the Augmented Reality and 3D models operate properly.

6) Deployment Phase

Once it has been tested and approved of the prototype, it will be installed on user's Android smartphone. The Implementation Phase will begin. Android devices also need to be prepared for installation and ready to use in the system. The prototype will be delivered whether over internet or physically send to the user and a formal review number is usually provided to prompt modifications at a later date.

7) Maintenance Phase

This Phase includes the Deployment Phase and includes with adaptation to Kampong Bharu Augmented Reality on Android mobile application devices or individual components to change attributes or enhance augmented reality output.

IV. PROTOTYPE DEVELOPMENT

At this Phase, the Waterfall approach is being employed to create the product of this mobile application. Beginning with the project's needs and restrictions in Phase 1, the Requirement Phase, and on to Phase 2, the Analysis Phase, where brainstorming and assessing what software may be employed to construct an Augmented Reality mobile application. Then go to Phase 3, the Design Phase, when the actual work begins. The User Interface (UI) must be built quickly in Adobe Illustrator to adequately show how the mobile application will look.

A. Hardware Requirement

Table 1: Hardware Requirement

Hardware	Functions
Computer	This computer will be used to build an Android application as well as function as an Android simulator

Hardware	Functions
	throughout the implementation phase.
Huawei Nova 3i Smartphone	This smartphone is used for testing the project's functionality and for clients views.

B. Software Requirement

Table 2: Software Requirement

Software	Functions
Adobe Illustrator 2019	Adobe Illustrator is a vector-based design and drawing application for professionals. Illustrator, when used as part of a wider design workflow, enables the development of everything from single design components to full compositions.
Microsoft Visual Studio 2017	Microsoft Visual Studio is an integrated development environment from Microsoft. It is used in the creation of computer software, websites, web applications, online services, and mobile applications.
3ds max 2019	3ds Max is a professional 3D computer graphics tool that can be used to create 3D animations, models, games, and photos.
Unity	Unity is software that many game makers use to construct and boost their games. Unity software is fantastic, extremely user-friendly, and completely free.

C. Prototype Design

Figure 4: Page list of Kampong Bharu AR Application

V. RESULT AND DISCUSSION

A variety of approaches can be used to test a given product application. The researcher tested the application using a questionnaire after finishing all of the design and development steps. The user was also given the option of using the mobile application.

A. Survey Result

UniKL students, students from another university, and visitors were surveyed through a questionnaire. These findings contribute to the ability of future frameworks to be enhanced and renewed. The reviews are performed on the application. The main surveys are classified into three categories: Section A: Demographics, Section B: Application Experience, and Section C: Opinion, considering the application's efficiency in protecting Kampong Bharu historical and cultural values The graphs and pie charts that follow describe and clarify the questions that were posed.

8. Do you think the application help you to know more about Kampong Bharu?
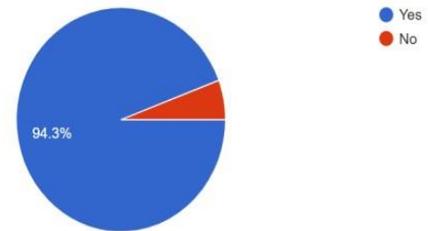35 responses

Figure 5: Do you think the application help you to know more about kampong Bharu?

According to Figure 5, the data shown in the pie chart reveal that 94.3 % agreed to stated "Yes" and just 6% answered "No" about the application, demonstrating that the software helped them learn more about Kampong Bharu.

7. Do you think the project succeed to preserve the historical and cultural value in Kampong Bharu?
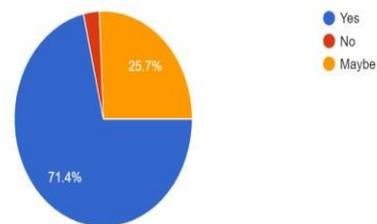35 responses

Figure 6: Do you think the project succeed to preserve the historical and cultural value in Kampong Bharu?

As shown in Figure 6, The pie chart findings reveal that 71.4 % agreed to say "Yes," 25.7 % said

"Maybe," and just 3% answered "No" about the application, proving that the application successfully preserves the historical and cultural significance in Kampong Bharu.

5. Do you think this application meets your expectation of delivered information about Kampong Bharu?
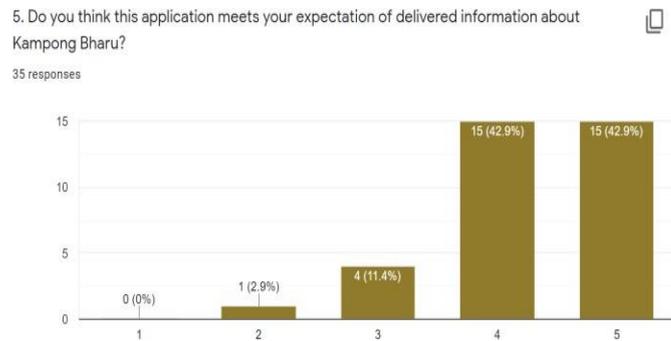
35 responses

Figure 7: Do you think this application meets your expectation of delivered information about Kampong Bharu?

According to the infographic findings, 85 % agree that the application successfully matches the expectation of Kampong Bharu information delivery. While 12 % agree, % mostly disagree. This finding indicated that this application may help users find information about Kampong Bharu.

VI. CONCLUSION AND RECOMMENDATION

A. Conclusion

This can conclude that many individuals love to travel and learn new things. The four parts of digital heritage preservation, tourism, and augmented reality will all contribute to Malaysia's economic development. Several earlier efforts have also aided researcher in performing the study and creating this project. Aside from that, researcher will go into research technique in the parts that follow.

The waterfall model was chosen as the design technique for the study. The smartphone application's purpose is to help users find and lead them to preservation sites in Kampong Bharu. As part of the waterfall concept, the director has additional examples that the community can take advantage of for tourism. Any model will suffice as long as the objectives of the study are achieved. Following that, the researcher may go to the next chapter, which discusses the development process.

According to the findings of the testing, the majority of the respondents are delighted with the functionality and user interface design of Kampong Bharu AR. The programme administration offers all materials and information

to let the user explore Kampong Bharu. Product testing has verified overall consumer satisfaction with the Kampong Bharu AR.

B. Future Recommendation

For future research purposes, several upgrades such as better 3D preservation construction, additional information, and additional functionality can be produced. These improvements should be implemented during the software development process. Interactive material and updated preservation places, for example, have been provided in Kampong Bharu.

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