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A DEVELOPMENT OF AR/INTERACTIVE DISPLAY METHOD AND ENVIRONMENTAL GRAPHIC AT ISLAMIC ART MUSEUM USING AUGMENTED REALITY

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POLITEKNIK NEGERI JAKARTA

BACHELOR IN CREATIVE MULTIMEDIA

MANAGEMENT & SCIENCE UNIVERSITY

2023

A DEVELOPMENT OF AR/INTERACTIVE DISPLAY METHOD AND ENVIRONMENTAL GRAPHIC AT ISLAMIC ART MUSEUM USING AUGMENTED REALITY

By

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Project Submitted in Partial Fulfillment of the Requirements for the Degree of Bachelor in Creative Multimedia (Hons.) in the Faculty of Information Sciences and Engineering

February 2023

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Abstract of project presented to the Senate of Management & Science University in partial fulfillment of the requirements for the degree of Bachelor in Creative Multimedia (Hons.).

A DEVELOPMENT OF AR/INTERACTIVE DISPLAY METHOD AND ENVIRONMENTAL GRAPHIC AT ISLAMIC ART MUSEUM USING AUGMENTED REALITY
By
MUHAMMAD REIHAN
February 2023

ABSTRACT

Faculty: Information Sciences and Engineering

Augmented Reality (AR) is a technology that can combine the real world with the virtual world in 3D and interactive form in real time. Museums of Islamic art are usually curated in such a way that visitors are not comfortable with the layout and environment within the space. The aim of this research is to enhance the experience with the development of Augmented Reality (AR) in the galleries of the Museum of Islamic Art. The target audience of this questionnaire is both local and foreign tourists who visit the Islamic art museum with the aim of enhancing their experience while in the exhibition in a different way. This paper uses the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) model it provides a proven method for designing clear and effective training programs. The findings of this research will contribute to the development of Augmented Reality (AR), which will offer environmental graphics in Islamic art museums, ultimately enhancing the overall visitor experience. As a result, this project provides with Augmented Reality technology, visitors can visit the exhibition virtually using only smartphones and Instagram/Facebook platforms. This study shows how the application helps to enhance the visitor experience in visiting the Islamic Art Museum exhibition.

Keywords: *Augmented Reality, Technology, Environmental, Islamic Art Museum, Exhibits.*

Abstrak proyek yang disampaikan kepada Senat Universitas Manajemen & Sains untuk memenuhi sebagian persyaratan gelar Bachelor in Creative Multimedia (Hons.).

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Oleh
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ABSTRAK

Fakulti: Ilmu dan Teknik Informasi

Augmented Reality (AR) adalah teknologi yang dapat menggabungkan dunia nyata dengan dunia maya dalam bentuk 3D dan interaktif secara masa nyata. Biasanya, muzium seni Islam diuruskan dengan cara yang membuat pengunjung tidak selesa dengan susunan dan persekitaran di dalam ruang tersebut. Tujuan kajian ini adalah untuk meningkatkan pengalaman dengan pembangunan Realiti Tambahbaik (AR) di galeri-galeri Muzium Seni Islam. Penonton sasaran soal selidik ini adalah pelancong tempatan dan asing yang melawat muzium seni Islam dengan tujuan meningkatkan pengalaman mereka ketika dalam pameran dengan cara yang berbeza. Kertas ini menggunakan model Analisis, Reka bentuk, Pembangunan, Pelaksanaan, dan Penilaian (ADDIE) yang menyediakan kaedah yang terbukti untuk merancang program latihan yang jelas dan efektif. Hasil kajian ini akan menyumbang kepada pembangunan Realiti Tambahbaik (AR), yang akan menawarkan grafik persekitaran di muzium seni Islam, akhirnya meningkatkan pengalaman pengunjung secara keseluruhan. Akibatnya, projek ini menyediakan teknologi Realiti Tambahbaik, pengunjung dapat melawat pameran secara maya hanya dengan menggunakan telefon pintar dan platform Instagram/Facebook. Kajian ini menunjukkan bagaimana aplikasi ini membantu meningkatkan pengalaman pengunjung dalam melawat pameran Muzium Seni Islam.

Kata Kunci: Augmented Reality, Teknologi, Persekitaran, Muzium Seni Islam.

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final project. Finally, we return all our affairs to Allah SWT, and the author hopes that

this research can be useful for all parties.

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CHAPTER I
INTRODUCTION

1.1 Project Backgorund

Islam has a lot of cultural and historical heritage to be proud of. A museum is one tool that can be utilized to transmit this historical and cultural knowledge to future generations. The museum is one of the attractions to add insight and knowledge in which there are objects of past cultural heritage. The museum is in charge of collecting, registering, maintaining, and exhibiting collections for the purpose of insight, knowledge, education, and research resources for the general public.(Brata & Brata, 2018)

There are many cases of damage to museum collections by visitors who are careless in handling these objects. This of course has an impact on reducing interesting collections in museums which have an impact on decreasing interest in visiting museums. According to Jean, the decline in visitor interest has made it a challenge for them to be more innovative and creative with more creative ideas.(Brata & Brata, 2018)(Maluku, 2017)

Technology was created by humans to help and facilitate the work in life. This is also offered with the presence of the technology concept of Augmented Reality (AR). Use Augmented Reality is currently developing rapidly. For example, in the world of tourism in terms of attracting museum visitors, the presence of displays and environments that are physically and directly can now be added with displays and interactive environments with AR technology. The information visualization capabilities of AR give a real impression on the application.(Laswi & A, 2018)

1

Augmented Reality (AR) is a technology that can combine the real world with the virtual world in 3D and interactive in real time. AR technology can create unique experiences that expand opportunities and direct user involvement.(Jamil, 2018) The birth of this technology makes it easier for users to feel different sensations, because illustrative information such as text, images, animation, sound and video can be displayed so real. AR has been applied in many fields such as health, tourism, education and business. Many cultural tourism organizations are trying to use Augmented Reality (AR) to enhance the visitor experience.(Putra et al., 2020)

There are many forms of promotional media that can be used by cultural tourism organizations, one of which is printed promotional media in the form of brochures that are often found in tourism entrance areas, events, and others. And usually the brochures are distributed to people around the brochure distribution area. However, in general, brochures only contain information related to products and 2D images, this is not very satisfying for visitors in this increasingly advanced era. Therefore, an alternative is needed to support promotion using brochures so that visitors can have a different experience.(Arum et al., 2021)

Islamic Art Museum Malaysia is a history museum located in the Kuala Lumpur area. Until now the existence of the museum is very popular with many people in Kuala Lumpur and even foreign tourists who make the Islamic Art Museum Malaysia a tourist facility, but what is happening now is the lack of interest in the curiosity of the people who visit there.

Based on the project background above, this research will present an Augmented Reality application to design an environment and display design project at the Islamic Art Museum with brochures as an intermediary medium. The design of the AR application is intended as an alternative technology-based learning with an explanation in the form of text and animated videos that can be additional information from a museum. the existence of this application can make the delivery of information more interesting and able to make users feel interested in using it, thereby making users aware of the information contained in the application. In addition, the application of AR technology is expected to invite the public to interact while getting to know the history, culture and collections of the Islamic Art Museum.

1.2 Problem Identification

The following are the problem that will be appointed in this project.

a) When researcher gone to the Islamic Art Museum Malaysia on October 1, 2022 from 1.00 PM – 4.30 PM I as it were met many visitors, but not more than 100 individuals.

b) With the museum area that's as ell expansive makes visitors a small tired so they can't enjoy the museum's displays as a whole and even some of the displays are missed by visitors.

c) The number of cases of museum collections damaged due to carelessness of visitors.

d) At the Islamic Art Museum Malaysia, the display presents too much text, few graphics and no technology implementation in it.

e) At the Taxidermy Miracle Exhibition, the Minister of Travel, Arts and Culture said that the museum's income in 2020-2021 decreased to 70%.(Harian, 2021)

1.3 Research Question

Based on the problem statement, the research question are below;

a) How to AR can enhance experience in Islamic Art Museum Malaysia gallery?

b) What does it take to make the display attractive using Augmented Reality technology?

c) Why is the attraction of visitors to the Islamic art museum reduced?

d) How to reduce the risk of damage to museum collections due to the carelessness of visitors in holding these objects?

1.4 Objective(s) of the Project

The following are the main objectives for the project. The main objectives are the goal for every research question.

I. General

This study aims to enhance experience by the development of an Augmented Reality in Islamic art museum gallery

II.   Specific

a)   To explore the elements of Islamic design in museum through Augmented Reality (AR).

b)   To design an appropriate environmental graphic at Islamic Art Museum.

c)   To develop Interactive AR for viewing display in Islamic Art Museum.

1.5   Definition of Terms

I.   Museum

A museum is a not-for-profit, permanent institution in the service of society that researches, collects, conserves, interprets and exhibits tangible and intangible heritage. Open to the public, accessible and inclusive, museums foster diversity and sustainability. They operate and communicate ethically, professionally and with the participation of communities, offering varied experiences for education, enjoyment, reflection and knowledge sharing.(ICOM, 2022)

II.   Islamic Art Museum

Islamic Art Museums not only depict art created specifically to serve the Islamic religion (eg, mosques and their furnishings) but also feature art and architecture that were historically produced on Muslim-ruled lands, produced for Muslim customers, or created by Muslim artists.(Art, 2001)

III. Brochure

A brochure is an informative paper document for advertising, which can be folded into a template, pamphlet, or leaflet. Brochures are promotional documents, primarily used to introduce a company, organization, products, or services and inform potential customers or members of the public of the benefits. They are usually distributed inside newspapers, handed out personally, or placed in brochure racks in high traffic locations.(Freeman, 2021)

IV. Smartphone

A smartphone is a handheld electronic device that provides a connection to a cellular network and the internet. The world's first smartphone was created by IBM in 1994, nicknamed Simon. 1. The introduction of smartphones dramatically altered the telecommunications sector. (FRANKENFIELD, 2022)

V. Mobile Application

A mobile application, most commonly referred to as an app, is a type of application software designed to run on a mobile device, such as a smartphone or tablet computer. Mobile applications frequently serve to provide users with similar services to those accessed on PCs. Apps are generally small, individual software units with limited function.(Techopedia, 2020)

VI. Augmented Reality

Augmented Reality (AR) is a new technology that involves the overlay of computer graphics on the real world. As a result, the user can see the real world

augmented with virtual objects and can interact with them. Within a more general context, AR is also termed Mixed Reality (MR).(Phan & Choo, 2010)

1.6 Significance of the Project

It was emphasized by the completion of this research, can develop Augmented Reality animation with text, music, applications and graphics. Hopefully, it will help in educating and improving the public experience in the museum Islamic art.

1.7 Scope of the Project

The main scope of this study is to focus on the developing Augmented Reality and environment in museum Islamic art. The target research audience for this project are local tourists as well as international tourists visiting the Islamic art museum with the aim of enhancing their experience at the Islamic Art Museum.

1.8 Assumptions and Limitations

A. Assumptions

An assumption is something that may be true and could occur without any proof of action. The following are the assumptions that might occur at the conclusion of this project:

1) Users or Visitors can experience a new experience by using Augmented Reality (AR).

2) Applications can attract visitors to know the objects of the Islamic Art Museum.

3) The application's User Interface (UI) is easy to use and understand.

B. Limitation

There are going to be limitation in the development of every project. Limitations are the limits of the project's capacity. Here are some of the limitations:

1. As an international student, researchers have obstacles to physically explore museums due to budget and transportation

2. Limited 3D objects for models of objects in the Islamic art museum

3. As a double degree student, the researcher only has a limited time to complete this project
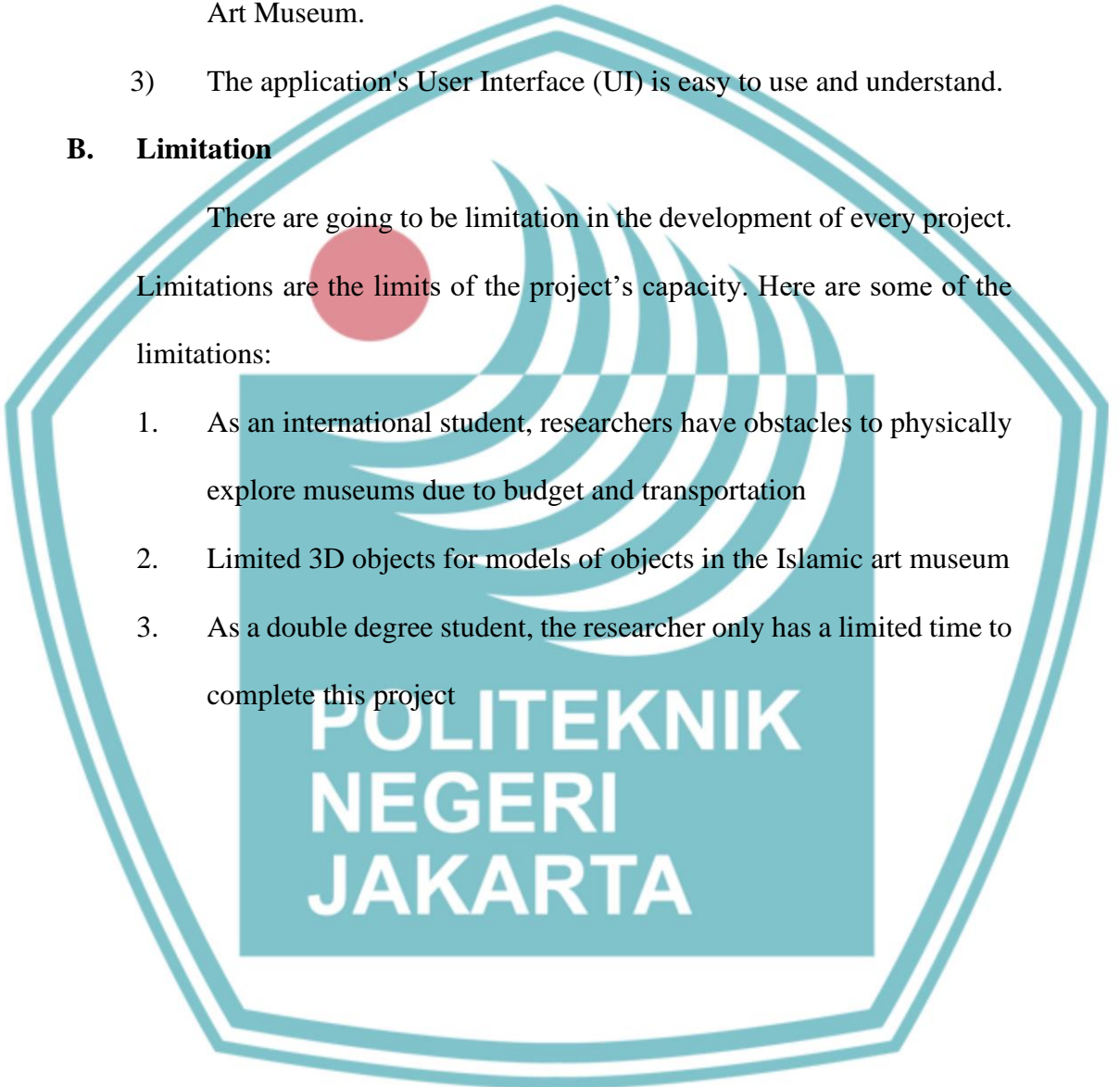
CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1   Summary

The attractiveness of visitors to the local and international Islamic Art Museum is currently decreasing and there are many cases of museum collections being damaged due to the carelessness of visitors. The museum's display of narrative and storytelling is limited to its early years of establishment. However, with the surge in technology and the approach of the 21st century that is accessible for public use, museums have implemented augmented reality to attract visitors and enhance the experience in the museum.

This study aims to improve the experience for visitors to the Islamic Art Museum, by using Augmented Reality technology on the Instagram and Facebook platforms. By exploring the exhibits in a different or virtual way, and being able to interact directly with the environment and objects in the museum, visitors will get a different experience from before when visiting the Islamic Art Museum.

This study uses the ADDIE Model methodology. In this research, the instrument used was a questionnaire to obtain the data needed to support the research.

5.2   Conclusion

After looking at the results of the feedback questionnaire, it can be concluded that:

1.   The elements of Islamic design in the museum can be explored using Augmented Reality (AR)

Can Islamic design elements in museums be explored using Augmented Reality?
40 jawaban

Yes
No
97,5%
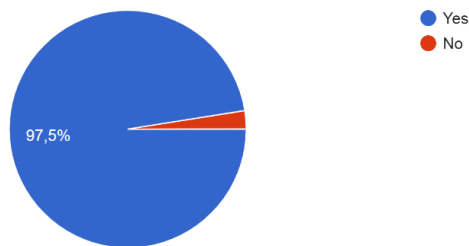
Figure 5. 1: Question 1

2.   The environment designed is suitable for the Museum of Islamic Art

Is the designed environment suitable for an Islamic Art Museum?
39 jawaban

Yes
No
97,4%

Figure 5. 2 : Question 2

3.   Augmented Reality developed interactive to view the displays at the Museum of Islamic Art

Is Augmented Reality developed interactive for viewing displays at the Islamic Art Museum?
40 jawaban

● Yes
● No

100%
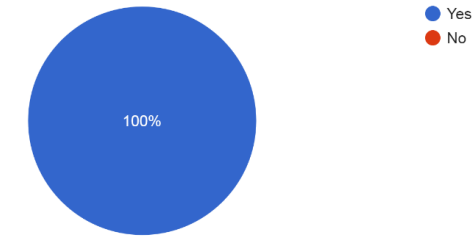
Figure 5. 3 : Question 3

4.   Augmented Reality that has been developed provides a new experience for visitors in visiting museums virtually

Does the Augmented Reality that has been developed, visitors get a new experience in visiting the museum virtually?
39 jawaban
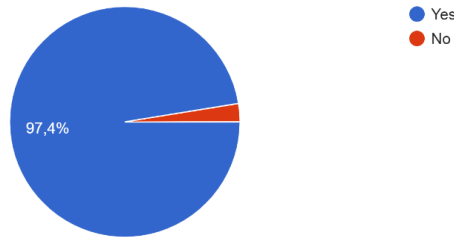
● Yes
● No

97,4%

Figure 5. 4 : Question 4

5. Visitor are satisfied with the product
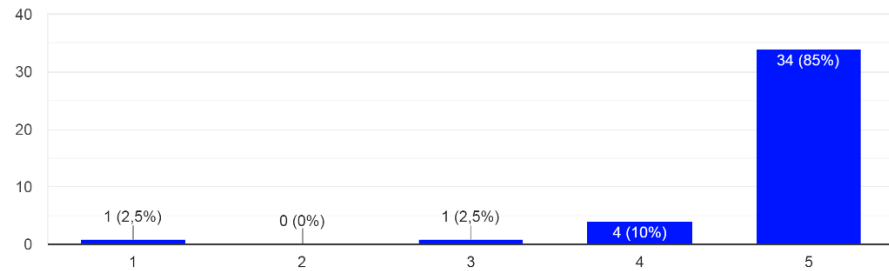
Figure 5. 5 : Question 5

5.3   Recommendations

Based on the results of the questionnaire and year-end assignments, there are several things that can be added to make Augmented Reality more effective. The first is to provide Backsound / Sound in the museum or video object. Second, adding more 3d objects in the Augmented Reality Islamic Art Museum. And the last is to provide some texture details on the environmental Augmented Reality Islamic Art Museum.

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APENDIX

QUESTION IN GOOGLE FORM

A. Questionnaire 1

Hello, my name is Muhammad Reihan, candidate for Bachelor in Creative Multimedia from Management and Science University. Please allow me to request Mr., Mrs., Brothers and Sisters' willingness to take part in filling out and answering all of the questions on this form. This research was needed to construct a thesis entitled "A DEVELOPMENT OF AR/INTERACTIVE DISPLAY METHOD AND ENVIRONMENTAL GRAPHIC AT ISLAMIC ART MUSEUM USING AUGMENTED REALITY".

1. Age?
   - o   18 – 20 years
   - o   21 - 29 years
   - o   30 – 39 years
   - o   Above 40 years

2. Occupation?
   - o   Government sector
   - o   Private sector
   - o   Self employee
   - o   Unemployee/Student

3. Location? (ex: Klang Valley, Jakarta, Padang, Kuala Lumpur,etc.)

   Open Question

RO 1 :

4. Do you like technology to be interactive, and encourage interaction with exhibits?

   o Yes

   o No

5. Can interactive content enhance your learning and understanding of museum exhibits and content?

   o Yes

   o No

6. Have you experience going to Islamic Art Museum?

   o Yes

   o No

7. Would you like to see more museums use technology in the future?

   o Yes

   o No

8. Do you find applications that use animation between the real and virtual worlds interesting?

   o Yes

   o No

RO 2 :

9. Do you agree that the Environmental Graphic Apps Suitable at Islamic Art Museum

   o Stongly disagree

   o Disagree

   o Neither agree nor disagree

   o Agree

   o Strongly agree

10. Do you agree that Environmental Graphic can attract visitors

    o Stongly disagree

    o Disagree

    o Neither agree nor disagree

    o Agree

    o Strongly agree

11. Can Augmented Reality applications be used as a media promotion for museums?

    o Stongly disagree

    o Disagree

    o Neither agree nor disagree

    o Agree

    o Strongly agree

RO 3 :

12. Does the display in the museum look boring?

- o Never
- o Rarely
- o Sometimes
- o Often
- o Always

13. Are the interactive displays in the museum interesting?

- o Never
- o Rarely
- o Sometimes
- o Often
- o Always

14. Do you visit museums to get experience?

- o Never
- o Rarely
- o Sometimes
- o Often
- o Always

B. Questionnaire 2

Feedback

Thank you for taking the time to fill out this questionnaire. Your feedback is critical in improving the DEVELOPMENT OF AR/INTERACTIVE DISPLAY METHOD AND ENVIRONMENTAL GRAPHIC AT ISLAMIC ART MUSEUM USING AUGMENTED REALITY. If you have any further comments or concerns, feel free to contact me at reihan885@gmail.com. I appreciate your dedication to support researchers promoting technological developments at the Museum of Islamic Art to enhance the visitor experience!

1. Can Islamic design elements in museums be explored using Augmented Reality?
   o Yes
   o No

2. Is the designed environment suitable for an Islamic Art Museum?
   o Yes
   o No

3. Is Augmented Reality developed interactive for viewing displays at the Islamic Art Museum?
   o Yes
   o No

4. Does the Augmented Reality that has been developed, visitors get a new experience in visiting the museum virtually?

o Yes

o No

5. How satisfied you are with the product?

o Very Dissatisfied

o Dissatisfied

o Enoguh Satisfied

o Satisfied

o Very Satisfied

6. Suggestion

Open Question