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Design Of Augmented Reality As A Promotional Media At University Of Raharja

Saryani[1], Novi Cholisoh[2], Gian Nurwana[3]
University of Raharja[1,2,3]
Jenderal Sudirman No.40, Cikokol, Kota Tangerang[1,2,3]
Indonesia[1,2,3]
e-mail: saryani@raharja.info[1], novi@raharja.info[2], gian.nurwana@raharja.info[3]

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Abstract

Augmented Reality is a technology that combines two-dimensional and or three-dimensional virtual objects into a natural three-dimensional environment and then projects these virtual objects in real-time. Multimedia technology has increasingly been applied in various industrial sectors as an information media for various purposes and is no exception as a promotional media. The University of Raharja, as an example of an ICT college in Tangerang, is currently experiencing very rapid development. School of Management and Computer Information Raharja evidenced it into the University of Raharja. This is, of course, a very positive impact, especially for the promotion activities of the University of Raharja. In this study, an Augmented Reality design for the University of Raharja was made to be used as promotional media.

Keywords: *augmented reality, media promotion, university.*

1. Introduction

In the current era of digital technology, there are many ways to do promotions, in addition to the usual ways that we are familiar with using print media, such as brochures, banners, posters, and others. The utilization of computer technology in terms of promotional media is an innovation to make promotions more engaging, interactive, and innovative. Computer technology is also developing very rapidly regarding hardware and software, which are used in an integrated manner to convey information and knowledge in visual form.

Promotion is an introduction in order to advance the trading business. Promotion is to advance the trading business and the role of the Company to interact and communicate with target consumers. This process is called Integrated Marketing Communication (IMC), in which there is a process of interaction and various other marketing activities [1]. Media promotion is a tool or means used for promotion. 2 kinds of promotional media are currently developing, from conventional media to unconventional media. The most conventional and old promotional media is word of mouth. Other promotional media are brochures, leaflets, flyers, posters, billboards, newspaper advertisements, glass television, wall clocks, business cards, stickers,

and so on [2]. This is closely related to Augmented Reality, which is developing fast and has been widely used in various fields.

Augmented Reality (AR) is a term for an environment that combines the natural world and the virtual world and is created by a computer so that the boundary between the two becomes very thin [3]. Augmented reality technology helps simplify natural objects by bringing virtual objects to receive information from all users [4]. Augmented Reality is a variation of Virtual Environments (VE), currently more often referred to as Virtual Reality. The user is completely immersed in a synthetic (artificial) environment in VE technology. In contrast to Augmented Reality, users can see the real world with visual objects added to natural objects or objects [5]. AR technology is believed to change marketing dynamics with increasingly sophisticated and accurate tools, with extensive application in various business lines and industries. AR technology for the world of advertising is currently proliferating worldwide. Call it the Augmented Reality Automotive application, Augmented Reality Furniture, Augmented Reality Education, Augmented Reality Print Materials, and many more. It is Augmented Reality Technology. It can be a great tool to show potential consumers the advertised product [6]. Information about objects and the environment can be added to the augmented reality system, which can then be displayed on the phone screen in real-time as if the information was accurate [7]. AR as a technology that combines two-dimensional and three-dimensional objects into a real three-dimensional sphere and projects them in real-time [8].

Augmented Reality aims to develop technology that allows real-time merging of digital content created by computers with the natural world, which can also use other media in the form of paper, a marker, or a marker through specific input devices. Augmented Reality technology can also be used to design a concept of extension of information from print promotional media to promotional media in videos and the addition of virtual objects in 2 or 3 dimensions [9]. Augmented Reality (AR) has the potential to attract, inspire, motivate, explore, and control students from several different perspectives and perspectives. AR amalgams several virtual objects (images, text, and animation) and the physical environment (real world). AR is the use of information and communication technology systems in audio-visual media [10].

With the existence of 3D visualization in augmented Reality, multimedia applications for promotional media are expected to add an exciting and interactive variety of promotional media; the authors made a study entitled "Designing Augmented Reality as Promotional Media at the University of Raharja."

2. Research Method

The methodology used in this research is a multimedia software engineering methodology with engineering steps including Concept, Design, Material Collecting, Assembly, Testing, and Distribution.

2.1 Concept

Stage concept (concept) stage to determine goals and objectives determine goals and objectives so that users can accept the resulting program.

2.2 Design

Design is the stage of designing or making specifications regarding the program architecture, style, appearance, and material requirements.

2.3 Material Collecting

Material Collecting is the stage where the collection of materials that meet the needs is carried out. This stage can be done in parallel with the assembly stage. In some cases, the Material Collecting and Assembly stages will be carried out in a non-parallel linear manner.

2.4 Assembly

The assembly stage (making) is where all multimedia objects or materials are created. Application development is based on the design stage.

2.5 Testing

is carried out after completing the assembly stage by running the application/program and seeing whether there are errors. This stage is also known as the alpha testing stage (alpha test), where the test is carried out by the maker or the maker's environment.

2.6. Distribution

The stage where the application is stored in a storage medium. At this stage, if the storage media is not sufficient to accommodate the application, then compression is carried out on the application.

3. Research Results and Discussion

Design Augmented Reality in this study is represented in object-oriented modeling through the Unified Modeling Language (UML).

Figure 1. Illustration of Application Design

3.1. Use Case Diagram

Diagrams that describe the function of a system from a user perspective use case diagrams that describe the typical interactions between users of a system and the system itself. In the system, there are users, namely application users (users); the roles of existing actors can be seen in the following use case diagram:

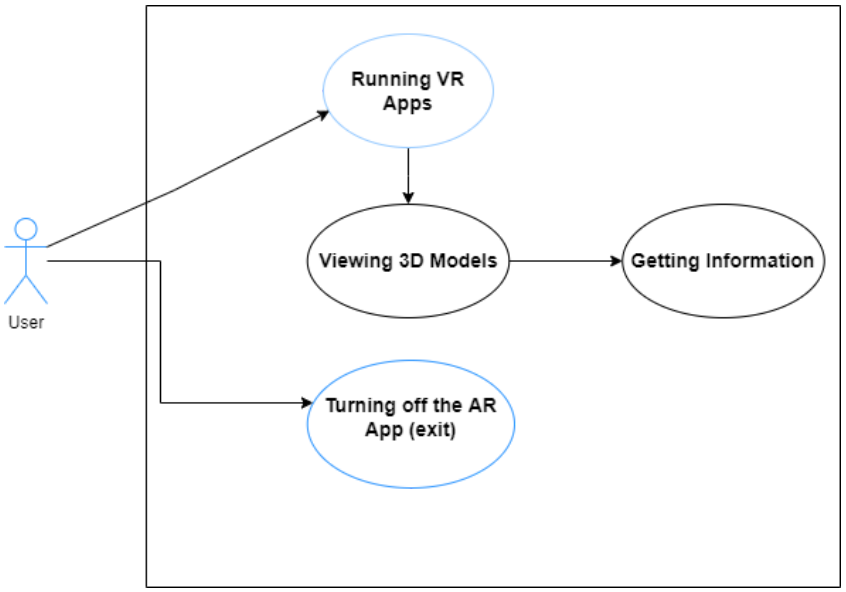

Figure 2: Use Case Diagram

Description Use Case Diagram:

1. The user runs the Augmented Reality application, sees 3D mode and obtains information.
2. The user turns off the Augmented Reality application (exit).

3.2. Activity Diagram

An activity diagram describes the flow of activity in the system that is being designed, which explains each flow starting, decisions that may occur, and how they end. Where one or more use cases can realize an activity. Activities describe the running processes, while use cases describe how actors use the system to perform activities.

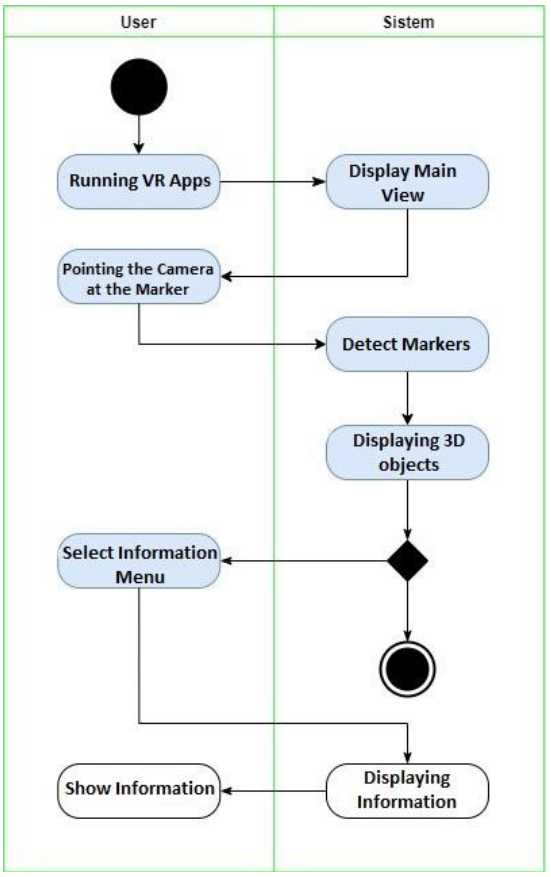

Figure 3: Activity Diagram

This activity starts when the user runs the Augmented Reality application and the system displays the main view. Then, the user points the camera at the marker, and the system detects the marker and displays a 3D object. Next, the user chooses what information to view.

3.3. Sequence Diagram

Sequence Diagrams are used to describe the interaction between objects in and around the system (including users, displays, and so on) in the form of messages depicted against time. Sequence diagrams consist of a vertical dimension (time) and a horizontal dimension (related objects)

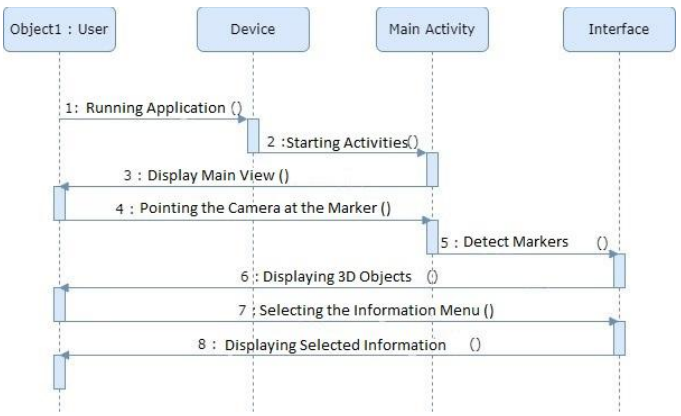

Figure 4: Sequence diagram

The picture above describes the process of selecting the information menu starting from the user running the Augmented Reality application, and the system displays the main display; then the user directs the camera to the marker, and the system detects the marker and displays 3D objects. Users can also select information to view the available information.

3.4. Design

The design process is carried out by making marker designs and interface designs that are used as Augmented Reality Content.

3.4.1 Marker

Used in the form of the University of Raharja logo, which is found on the campus brochure.

Figure 5: Design Marker

3.4.2. Interface Design

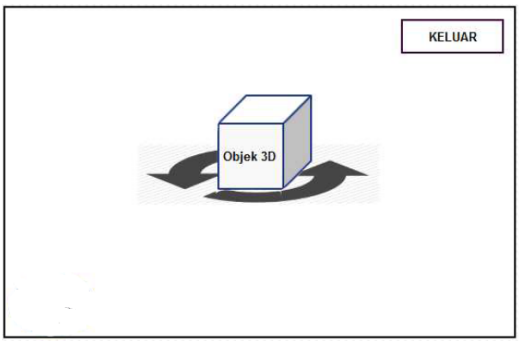

Figure 6: Interface Design of 3D Object

Figure 6. It is a design of the interface design of the Augmented Reality application. Later the user can choose which information to display.

3.5. Material Collecting

The materials needed in making this application were obtained from several sources on the internet with several modifications.

3.5.1. Images

used in this application are obtained from the internet for free, with modifications in certain parts to meet the requirements.

Figure 7: Campus Brochure

3.5.2. Audio and Video

Audio and video used in this application are obtained from the internet to meet the requirements.

Figure 8: Video profile of University of Raharja

3.6. Creating AR Content in XR.Plus

AR content creation can be done with the following steps:

1. Insert markers into the XR. Plus a web-based studio.
2. Insert overlays or animations used as XR. Plus, Augmented Reality content.
3. Please provide the name of the available AR content to make it easier to find content in the Aurasma AR application later.
4. Share AR content so that other users can see it.

3.7. Testing

Tests are carried out to verify whether the application has adequately run according to the previous design. The test is carried out on markers that have been made previously. The test results show that the marker can display satisfying Augmented Reality content. The distance test shows promising results in the range of 5-40 cm with normal lighting conditions in the room.

Table 1: AR Content Testing Results

No	Distance	Status
1	10 cm	AR content appears
2	20 cm	AR content appears
3	30 cm	AR content appears
4	40 cm	AR content appears
5	50 cm	Sometimes appears, sometimes does not
6	60 cm	AR cannot appear

Figure 9: AR Content Testing Results

4. Conclusion

The conclusions obtained from the results of this study include:

1. This study resulted in an Augmented Reality application design as a promotional media at the University of Raharja.
2. The resulting design includes the design of the application flow, the functional application, and the design of the application interface.
3. The resulting design can describe the application clearly and display 2D image objects in 3D; information that has not been included in the brochure can be displayed virtually and attractively.
4. The design can be used for the subsequent implementation stage.

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