JURNAL TEKNOLOGI DAN OPEN SOURCE
Vol. 5, No. 2, Desember 2022, pp. 94~104
e-ISSN: 2622-1659, accredited Four Grade by Kemenristekdikti, Decree No: 36/E/KPT/2019
DOI: 10.36378/jtos.v3xx

Virtual Tour Three Dimensions (3D) With Polygonal Modeling At Sang Nila Utama Museum

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Article Info

Article history:

Received 09 25, 2022
Revised 09 27, 2022
Accepted 11 16, 2022

Keywords:

Virtual Tour
Museum
Three Dimension
Polygonal Modeling
MDLC

ABSTRACT

Sang Nila Utama Museum is an institution that functions as a place for the storage, care, safeguarding and use of objects of human culture and natural products to support efforts to protect and preserve cultural wealth. Based on the results of the surveys and interviews conducted, there are currently problems, namely 1) There is no system to present information about the collection of objects in the museum visually in 3D. 2) Due to the outbreak of Covid 19 virus, the museum management had to close the museum so far, so the public is not able to visit the museum to get information about the collection of historical relics in the Sang Nila Utama Museum. Based on the problems described above, an Android-based application for a virtual tour of exhibitions of historical objects was developed. The virtual tour is a result of the development of multimedia information technology and 3D technology that can present a 3D atmosphere. In developing this system, the Multimedia Development Life Cycle (MDLC) method was applied, which consists of several phases, namely: concept, design, material procurement, compilation, testing and distribution. This application will later run on the Android platform and use a mobile stick controller as a medium for navigation, allowing users to walk through the museum space to see a collection of historical relics in three-dimensional (3D) visual form. It is expected that this research will be one of the solutions to overcome the problems encountered in trying to improve services to the community.

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1. Introduction

A museum is an institution designed to collect, maintain, present and preserve the cultural heritage of the people. The museum is also a permanent, non-profit institution serving the needs of the public, with an open character, by collecting, preserving, researching, conveying and exhibiting objects to the community for the needs of study, education and enjoyment. [1] Based on the Government Regulation of the Republic of Indonesia No. 19 of 1995, museums are institutions, places for the storage, care, safeguarding and use of material evidence objects from human culture and nature and environment to support efforts to protect and preserve the cultural wealth of the nation. The Sang Nila Utama Museum is a museum in Pekanbaru town that collects and preserves various cultural objects closely related to culture, especially the Malay Riau culture. From the findings of the preliminary observations, there are several problems that occur today, namely: the stigma of people thinking that visiting the museum is just a boring and ancient activity where the museum has no attraction that makes the museum one of the main destinations to visit during leisure or

holiday, then there is no system to present information about the collection of historical relics in Sang Nila Utama Museum that are presented virtually. Another problem is that since the outbreak of Covid 19 virus in 2019, the director of the main Indigo Museum had to close the museum, so the number of visitors declined and the service to visitors also left much to be desired. Starting from information and technology in communicating the museum collections, there is a need for media and technology that can attract tourists to the museum.

One of the media that can be used is the three-dimensional (3D) VirtualTour technology to visualize the exhibition of historical relics in the mobile " Sang Nila Utama Museum". This application is a result of the development of information technology in multimedia, especially three-dimensional (3D) technology, which can be one of the solutions to improve the service to the community. The virtual tour is a technology that makes it possible to simulate real objects by using devices that present a three-dimensional (3D) atmosphere to make users feel like they are physically involved [2] A virtual tour can also be described as a simulation of a real environment displayed online. It usually consists of a collection of panoramic photographs, a collection of images connected by hyperlinks, or videos and virtual models of the actual location, and may use other multimedia elements such as sound effects, music, narration and writing. A virtually simulated area can be designed to resemble the real world [3]. Presentations in a virtual tour can also be made using images, videos and three-dimensional (3D) models. There are various techniques when creating 3D objects, such as polygonal modelling. Polygonal modelling is an approach to object modelling that uses points to define the surface so that layers can be created from a three-dimensional (3D) model.A polygon is a two-dimensional (2D) shape in the form of a gestalt where n represents three or more sides. In general, a polygon is a face of a three-dimensional (3D) shape consisting of a vertex, an edge and a face. A polygon can be compared to a single triangle that can later form a three-dimensional (3D) object when developed and arranged.

Previous researches related to some of them are [4] The application of Main Sang Nila Museum Based on Mobile With 3D Technology, which is secured in this study, is one of the technologies used as a medium to imagine the environment both outside and inside of Main Indigo Museum with augmented reality technology, while in the study [5] The Mobile-Based 3D Virtual Reality Application as a Medium for Promoting Riau Malay Culture at the Sang Nila Utama Museum in Pekanbaru presents the appearance and content of the museum using virtual reality technology, this study uses a virtual box to concentrate the research results. The virtual tour itself does not rely only on a 3D design, as shown in the study [6] 360-Degree Interactive Virtual Tour Using Image Stitching Technique as Information Media for the STMIK Amik Riau Campus, where real images are used as one of the media to introduce the environment of the study object. The use of techniques in 3D design itself can be seen in [2] Design for Android-Based Virtual Tour Application Using Polygonal Modeling and Extrude Face and [7] Housing Model With Polygonal Modeling Method And Virtual Reality-Based Extrude Face Technique, where the focus is on showing more complex 3D object modeling. With this background, the problem of this study is how to present the collection of the most important Indigo Museum in a mobile way using the technology of virtual tour, in which each collection of objects of the museum is presented in 3D using polygonal modeling as a manufacturing technique.

2. Research Methodology

2.1 Stages of Research

System Needs Analysis

System needs analysis is the identification of the functionality needs of the designed system. After analyzing the problem, it was determined that the needs of the system to be met by the system to be designed while the needs of the system are :P Users can take a virtual museum tour to see the collection of historical objects in Sang Nila Utama Museum. Then the system can present information about each collection of historical objects in Sang Nila Utama Museum.

Device Needs Analysis

The devices used in designing this application consist of software and hardware.

2.2 Design

The design in this phase follows the Multimedia Development Life Cycle (MDLC) method. The MDLC method is a method for developing applications specifically designed for multimedia [8]. The development of this multimedia method is based on six phases, namely concept, design, material collection, assembly, test and distribution [12]. Figure 2 shows the phases of the Multimedia Development Life Cycle (MDLC).

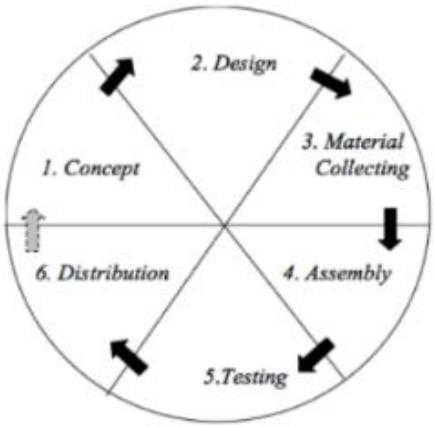

Figure 1. *MDLCMethod*

A. Concept

The concept phase is used to formulate the fundamentals of the system to be designed. In this phase, a concept is formulated, namely: The purpose of the application is to become an alternative information medium for the collection of historical relics in the Sang Nila Utama Museum and to become a learning medium in an effort to preserve the culture and history of the nation through the use of interactive multimedia technology.

B. Design

The design phase is used to describe the activities that take place in the system. For example, the system design process using Unified Modeling Language (UML) diagrams, which consists of designing system activities and designing interfaces. This design is used for analysis, understanding, visualization and documentation to test the designed system. System activity composition is performed to describe the activities that take place in the system. This design consists of modeling the interactions that occur in the system, modeling the attributes used in the system, and modeling the activities that occur in the system. The modeling used in this phase includes: Use Case diagrams, Activity diagrams, and Sequence diagrams.

Use Case Diagram

Use casediagram is a type of UML diagram that describes the interaction between systems and actors. Modeling the use casediagram in the design of this system can be seen in Figure 3.1.

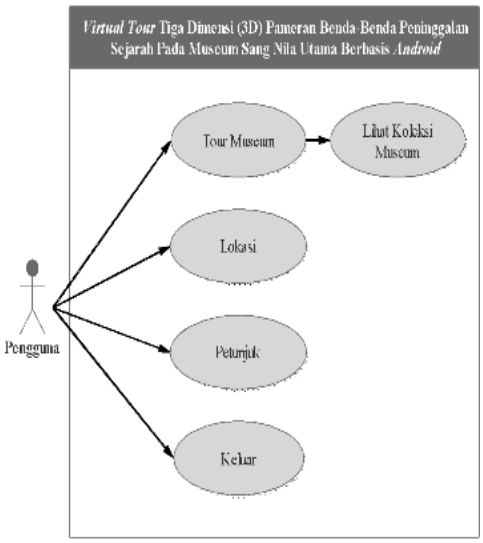

Figure 2. : *Use Case Diagram Sistem*

Users are actors who interact with applications designed to get the information they need. The interactions that can be done by users include :P users can tour Sang Nila Utama Museum virtually using a mobile stick controller as navigation. Then users can see the collection model along with information from historical objects contained in Sang Nila Utama Museum. As well as Users can see instructions for using the application on the menu provided.

Activity Diagram

Activity diagram is a type of UML diagram that describes the process and sequence of activities in a process.

a. ***Activity Diagram Tour* Museum**

The museum tour diagram activity illustrates how users tour Sang Nila Utama Museum virtually using a mobile stick controller as navigation.

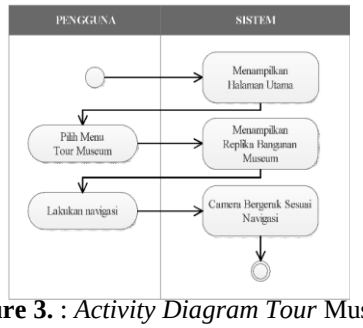

Figure 3. : *Activity Diagram Tour* Museum

***b. Activity Diagram* Lihat Koleksi Museum**

The museum collection view diagram illustrates how users see models from the collection of historical objects contained in Sang Nila Utama Museum in the form of three-dimensional (3D) models.

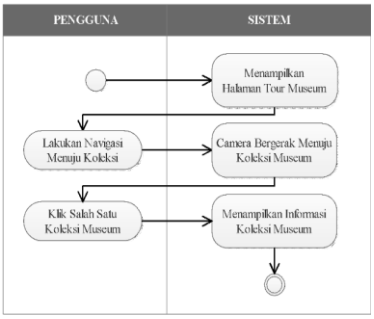

Figure 4. : Historical Object Diagram Activity

Sequence Diagram

A sequence diagram is a diagram that describes a series of phase performed in response to an event to produce a certain output.

***a. Sequence Diagram of* Museum Tour**

The museum tour sequence diagram illustrates the phase that occur when the user tours Sang Nila Utama Museum.

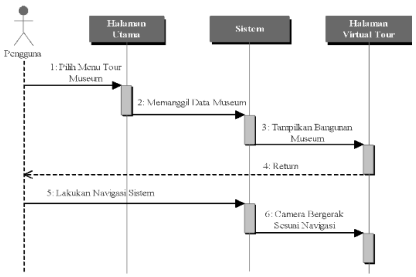

Figure 5. : *Sequence Diagram of* Museum Tour

***b.* Sequence Diagram of View Museum Collection**

Sequence diagram of view museum collection describes the phase that occur when the user views the collection of historical objects at Sang Nila Utama Museum.

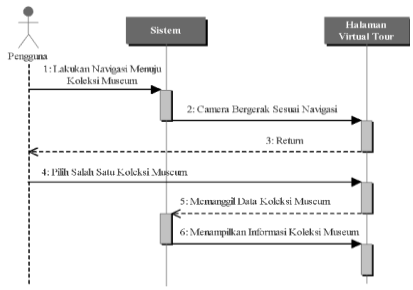

Figure 6. : Sequence Diagram of View Museum Collection

Interface Design

Interface design is a design that describes the appearance of the application being designed. This design is useful for management to make decisions and is something that cannot be ignored, because this design can make it easier for programmers to make applications.

a. Main Page Design

The main page design design is a design designed to display the start page when the user accesses the system. This page displays several menu options, namely: museum tour menu, museum location menu, instructions menu, and exit menu.

b. Museum Tour Page Design

Museum tour page design is a design designed to display a page for users to tour Sang Nila Utama Museum virtually.

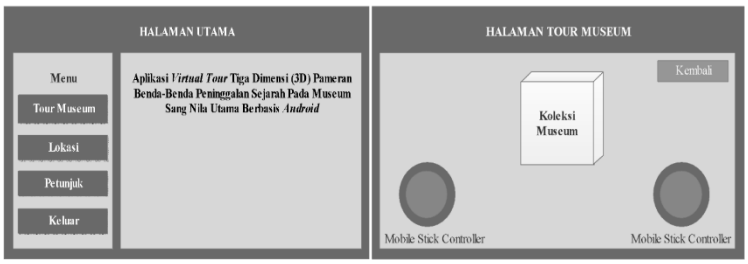

Figure 7. : Interface Design

C. Material Collecting

In this phase, the collection of materials is carried out to design the desired application. The materials collected for the creation of applications are images or photo collections of historical objects contained in the museum as reference materials for the creation of three-dimensional (3D) models, as well as video recordings that serve as reference for the creation of three-dimensional (3D) models from the interior of the Sang Nila Utama Museum.

D. Assembly

This phase is carried out to take into account aspects of function, aesthetics, and various other aspects with data sources obtained from research, thinking, and from pre-existing designs. The design process consists of 3 (three) stages, namely: three-dimensional (3D) model design, virtual tour design, and APK file formation.

a. Three-Dimensional (3D) Models with Polygonal Modeling Design

Designing a three-dimensional (3D) model is the process of creating a model of Sang Nila Utama Museum building along with the collection of relics contained in the museum. The polygonal model goes through several phases, namely: editing mode: this is a phase where you enter the editing mode to start editing the object. The following phase is scaling the object: this is a phase that sets the size of the object. To do this, press the S key on the keyboard and then the X, Y or Z keys on the keyboard to change the size of the object at the coordinates (X, Y or Z) as needed.

The next phase is to set the number of faces: Here you can set the number of faces of the object as needed. To set the number of faces press the CTRL + R keys on the keyboard. The next step is editing the faces: this is a phase where the size and shape of each face of the object is set to create the desired model.

a) Determining the Texture Coordinate Boundary: is the initial phase to texture the object. This phase aims to make it easier to map the coordinates on the object by selecting the seam tools that are already available in the blender application.

b) UV Mapping: is a phase of mapping coordinates to convert the face of a three-dimensional (3D) object into a two-dimensional object (2D) using the unwrap command on the UV mapping menu. This process can be done by pressing the U key on the keyboard, then select Unwrap.
c) ImportTexture : is the phase of combining images that will be textured on three-dimensional (3D) objects as needed.
d) Texture settings are phases that are carried out so that the texture of the object that has been created can become one material when the object is imported into the unity application to carry out the virtual tour design process. And the last is Rendering is a stage to see the final result of three-dimensional (3D) object modeling that has been done.

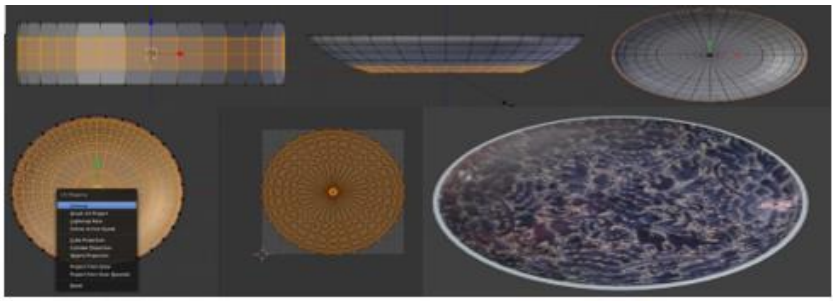

Figure 8. : *Stages of Designing 3D Models With Polygonal Modeling*

b. ***VirtualTour Design***

Virtual tour design is the process of creating a virtual tour using the unity application by combining several three-dimensional (3D) models that have been created in the previous phase.

c. ***APK File Formation***

The formation of an APK file is a process of converting the extention of the virtual tour program on unity into an application package file (APK) format so that the system that has been built can be installed and run on a smartphone. This process consists of several phases, namely: External Tool Preference Settings, Platform Settings and Build Application Package File (APK)

E. Testing

This phase is used to test the application and find out if it can be used and run properly. After the application is completed, the next phase is the process of testing the system and the users, where the testing of this system aims to find out whether this learning application works as planned and as a whole or not [16]. Therefore, researchers perform 3 types of testing, namely functional testing, performance testing and end user testing.**F. Distribution**

This phase can also be referred to as the evaluation phase for the development of a finished product to be better. The results of this evaluation can be used as input for the next phase [15]. In this phase the application will be saved to storage media such as hard drives and smartphones or distribute them.

1. Result and Discussion

3.1. System Implementation Results

The result of this study is an android-based mobile application that will be used by users with the following appearance:

Figure 9. : Main Page View

a. Main Page

The main page is the initial display page when users access the VirtualTour Three-Dimensional (3D) application for the Exhibition of Historical Relics at the Mobile-Based Sang Nila Utama Museum. This page has 4 (four) main menus, namely:

1. The museum tour menu serves to display the virtualtour page of Sang Nila Utama Museum.
2. The location menu serves to display the location page of Sang Nila Utama Museum integrated with google maps.
3. The instruction menu serves to display the app's instructions page.
4. The exit menu works for the user to exit the application.

b. ***Museum Tour Page***

The museum tour page is a page used by users to tour Sang Nila Utama Museum. The results of the implementation of the museum tour page are as follows:

1. Reception Room

   The Reception Room is a space that serves as an information center and provides services for visitors to the Sang Nila Utama Museum. This room is located in front of the main entrance of the Sang Nila Utama Museum building.

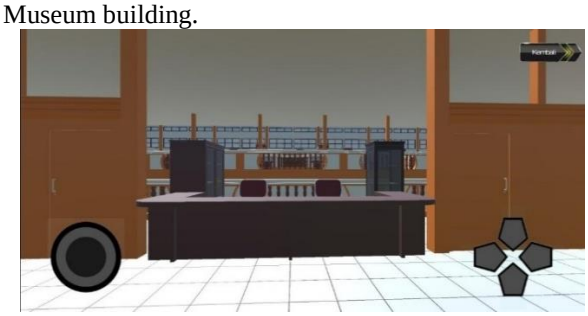

Figure 10. : Resepsionist Room

2. Collection Room

   The collection room is a room on the second floor (2) which is a storage place as well as a place to exhibit the collection of historical objects contained in Sang Nila Utama Museum.

Figure 11. : Collection Room

3. Museum Collections

   The museum collection is a replica of historical objects contained in Sang Nila Utama Museum which is displayed in three-dimensional (3D) visual form.

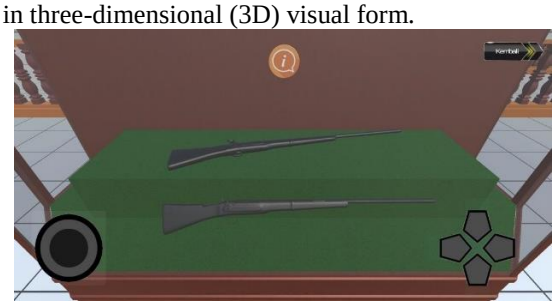

Figure 12 : Museum Collection

4. Museum Collection Information

   Museum collection information is a display that presents information related to the collection of historical objects at Sang Nila Utama Museum.

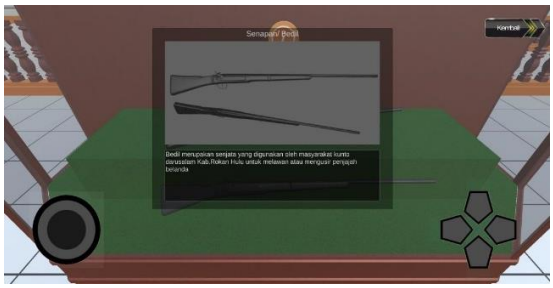

Figure 13. : Museum Collection Information

3.2 Testing System

Testing system was carried out to prove that the "VirtualTour Three Dimensional (3D) Exhibition of Historical Relics at the Mobile-Based Sang Nila Utama Museum" went according to expectations and had passed the error. The discussion of testing this system consists of testing techniques and conclusions of test results.

3.2.1 Testing Technique

The testing technique in this study was carried out using the black box testing technique which is a system testing that has a quality to the function of a system. The goal is to find malfunctions in the designed system. as well as seeing if the designed system can run according to its functional needs. If the designed system does not match its functional needs, a search is carried out to correct errors that occur in the system.

1. Main Page Testing

Main page testing is a test that is carried out to minimize errors that occur on the main page, so that the processes that occur on the main page run according to its functionality. More testing can be seen in table 1.

Table 1. Main Page Testing

Testing Page	Testing	Testing Expectations	Testing Results	Conclusion
Main Page	Select the menu available on the main page	Each selected menu can call up the application page based on the selected menu.	The application page appears as expected	*Valid*

2. Museum Tour Page Testing

Museum tour page testing is a test carried out to minimize errors that occur on the museum tour page, so that the process that occurs on the museum tour page runs according to its functionality.

a. Mobile Stick Controller Testing

Mobile stick controller testing is a test carried out on camera movements using a mobile stick controller, so that the camera can move according to the user's expected. More tests can be found in table2.

Table 2. *Mobile Stick ControllerTesting*

Testing Page	Testing	Testing Expectations	Testing Results	Conclusion
Museum Tour	The user navigates using the left mobile stick controller so that they can move forward and backward.	The camera view can move forward and backward as expected	View the camera moving as expected.	*Valid*
	Users navigate using the right mobile stick controller to be able to point the camera view to the right, left, up, and down.	Camera view can point to right, left, up, and down.	The camera view moves as expected	*Valid*

3. Museum Tour Testing

Museum tour testing is a test carried out on navigation in conducting a tour of Sang Nila Utama Museum. More tests can be seen in table 3.

Table 3. Museum Tour Testing

Testing Page	Testing	Testing Expectations	Testing Results	Conclusion
Museum Tour	Users navigate to tour the Sang Nila Utama Museum.	Sang Nila Utama Museum room can be seen in three (3D) form based on navigation direction	Sang Nila Utama Museum room can be seen as expected	*Valid*

4. Pop up Information Testing

Pop-up information testing is a test conducted on the display of information from the collection of historical objects in the museum available on the system. More tests can be seen in table 4.

Table 4. Pop up Informastion Testing

Testing Page	Testing	Testing Expectations	Testing Results	Conclusion
Museum Tour	The user presses the information icon contained in each collection of historical objects at Sang Nila Utama Museum.	The system can display information from a collection of historical objects.	Information appears as expected	*Valid*

5. Instructions Page Testing

Instruction page testing is a test that is carried out to minimize errors that occur on the application's instructions page, so that the process that occurs on the pointer page runs according to its functionality. This test is performed to ensure that information about the application's instructions for use can be displayed on the system. More tests can be seen in table 5.

Table 5. Instructions Page Testing

Testing Page	Testing	Testing Expectations	Testing Results	Conclusion
Application Instructions	Select the indicator menu available on the system	Information about the app's instructions for use can be displayed on the instructions page.	The information on the instructions for use of the application appears as expected	*Valid*

6. Smartphone Device Specification Testing

Smartphone device specification testing is a test performed to determine if applications can run on smartphone devices that have lower specifications compared to the specifications of the devices used by researchers. More tests can be found in Table 6.

Table 6. Smartphone Device Specification Testing

RAM Smartphone	Testing	Testing Expectations	Testing Results	Conclusion
6 GB	Run the application on the smartphone device.	The application runs smoothly without any problems.	The application can run as expected	*Valid*
4 GB	Run the application on the smartphone device.	The application runs smoothly without any problems.	The application can run as expected.	*Valid*
2 GB	Run the application on the smartphone device.	The application runs smoothly without any problems.	The application can run, but loading on the museum tour page becomes quite long	invalid

2. Conclusion

From the results of the design and the conducted tests of the system, it can be concluded that the system can be an information medium about the collection of historical objects contained in the Sang Nila Utama Museum. Then, the system can present visualizations of rooms and collections of historical objects in three-dimensional (3D) form using polygonal modeling. Based on the above conclusions, the researcher proposed to develop this system in the future so that the development of the museum building can be represented in the form of interior and exterior spaces, and then develop the completeness of the collection of historical objects in the Sang Nila Museum using a database to facilitate data changes and make the application more dynamic.

References

[1] Banjarnahor, D., Ginting, M. F.,Widyaningrum, I., Hidayati, H., Gozali,A. A., " MuseumBerbasis VirtualReality UntukMempromosikan Kebudayaan SumateraUtara." *E-Proceeding of AppliedScience*, *2*(2), 733–740, 2016.

[2] T.Sy Eiva F, M.Iqbal, "Design for Android-Based Virtual Tour Application Using Polygonal Modeling and Extrude Face," JAIA.,vol.1, no.1, pp. 19-27, 2020.

[3] Rivandi M, Dyah Mutiarin, Janianton D, "Virtual Tourism Alternatif Wisata Saat Pandemi," JITHOR., vol.4, no.1, pp.53-59, 2021.

[4] Yoyon Efendi, Agung M, "Aplikasi Museum Sang Nila Utama Berbasis Mobile Dengan Teknologi 3d Augmented Reality," JOISIE., vol.3, no.1, pp. 16-24, 2019.

[5] Efendi, Yoyon, dan Junaidi, "Aplikasi 3D Virtuual Reality Berbasis Mobile Sebagai Media Promosi Budaya Melayu Riau Pada Museum Sang Nila Utama Pekanbaru." Seminar Nasional SISFOTEK, pp.187–193,2018.

[6] Mardainis, M.Arifin, Rahmaddeni, Yoyon Efendi, "Virtual Tour Interaktif 360 Derajat Menggunakan Teknik Image Stitching Sebagai Media Informasi Kampus STMIK Amik Riau" Digital Zone J.Teknologi dan Informasi., vol. 11, no. 2, pp. 206-218, 2020

[7] Helda Yenni, Elvi Andriani, T.Sy Eiva Fatdha., "Model Perumahan Dengan Metode PolygonalModelingDan Teknik ExtrudeFace Berbasis VirtualReality," J.Teknik Infomatika dan Sistem Informasi., vol. 9, no.2, 2022.

[8] F.Dwi B, Rusydi U, Sunardi., "Visualisasi Museum Muhammadiyah Menggunakan Teknologi Augmented
Reality." JUST IT., vol.11, no.1, 2020.

[9] Baharuddin, Masnur, dan Rismayani.,"Aplikasi Virtual Tour Fakultas Teknik Berbasis Android." *Jurnal Sintaks Logika* 1(2).2021.

[10] Dianta, Ashafidz Fauzan, Zakha Maisat Eka Darmawan, Zulhaydar Fairozal Akbar, dan Kholid Fathoni., "Pengembangan Aplikasi Virtual Tour Sebagai Media Pengenalan Lingkungan Kampus PENS Berbasis Website." Jurnal Teknologi Terpadu 7(1), pp. 23–30, 2021.

[11] Falani, Achmad Zakki, Hendy Agha Satya Ramadan, dan Eman Setiawan.,"Implementasi Sistem Virtual Tour Berbasis E-Panorama Untuk Pengenalan Kampus Universitas Narotama Surabaya." Jurnal Insand Comtech 1(1), pp. 9–16,2016.

[12] Fauzi, Muhammad. 2019. "Penggunaan Tekhnik Blueprint Pada Pemodelan Objek 3D." Jurnal Teknik Informatika Kaputama, vol. 3, no.1, pp. 35–41, 2019.

[13] Hadinata, Novri, and Edi Supratman.,"Sistem Informasi Museum Negeri Provinsi Sumatera Selatan." Jurnal SISFOKOM, vol. 06, no.02, pp. 99–104, 2017.

[14] Hendini, Ade. 2016. "Pemodelan UML Sistem Informasi Monitoring Penjualan Dan Stok Barang (Studi Kasus : Distro Zhezha Pontianak)." Jurnal Khatulistiwa Infomatika IV(2): 107–16.

[15] R. C. Tijono, R. R. Isnanto, and K. T. Martono, "Penerapan Teknologi Augmented Reality Sebagai Sarana Promosi"Sarana Sejahtera Wilson's Office Chairs" Berbasis Android," vol. 3, no. 4, pp. 493–502, 2015.

[16] P. Teknik, I. Ft, and U. Negeri, "Pengembangan Aplikasi Augmented Reality Pengenalan Wisata Kota Manado Berbasis Mobile," Front. J. Sains Dan Teknol., vol. 1, no. 2, 2018, doi: 10.36412/frontiers/001035e1/agustus201801.09.

[17] Hafizh, Muhammad Patra, Torkis Nasution, dan Dwi Haryono., "Citra 2D Sebagai Representasi Benda-Benda Bersejarah Pada Museum Sang Nila Utama." Jounal Of Infomation System And Informatic Engineering, vol.2, no.2, pp.16-27, 2018.

[18] N, Xi., J, Hamari.,Shopping In Virtual Reality: A Literature Review and Future Agenda, Journal of Business Research, Vol 134, Hal 37-58, 2021

[19] T. Danny., C.K, Marvin.,C.O, Marleen., Changing Consumer Behaviour in Virtual Reality: A Systematic Literature Review, Computers ini Human Behavior Reports, Vol 3, Hal 1-6,2021

[20] Linowes, J., Unity Virtual Reality Projects: Explore The World of Virtual Reality by Building Immersive and Fun VR Projects Using Unity 3D, PACKT Publishing,2015.
[21] Nugraha, B.S., Firda, I.N., 2021, Perancangan Ruang Lingkungan 3D Untuk Aplikasi Virtual Reality Simulator Pengoperasian Alat Berat, Jurnal Teknologi Informasi, Vol 9, Hal 1-8
[22] Wijaksono, Sigit, Bonny A Suryawinata,and Michael Isnaeni Djimantoro. "Pengkajian Aplikasi 3D Untuk Permodelan Bangunan Bersejarah." (9): 751–56.
[23] Hendini, Ade. 2016. "Pemodelan UML SistemInformasi Monitoring Penjualan Dan StokBarang (Studi Kasus: Distro ZhezhaPontianak)." *Jurnal Khatulistiwa Infomatika*IV(2): 107–16.
[24]Hidayat, Rahmad. 2015. "Pemodelan Karakter3-Dimensi Menggunakan Geometri ShapePolygon Dengan Tehnik Extrude Face." *JurnalArsitekno* 6(6): 1–6.
[25] Hafizh, M. P., Nasution, T., & Haryono, D.(2018). Citra 2d Sebagairepresentasi Benda-BendaBersejarah Pada. *JOISIE JournalOf Information System And Informaticsengineering*, *2*(2), 16–27.