http://ejournal.seaninstitute.or.id/index.php/InfoSains
Jurnal Info Sains : Informatika dan Sains, Volume 13, No 03 2023
E-ISSN.2797-7889, P-ISSN.2089-3329

Development Of The Sambas State Polytechnic Campus Virtual Tour Application By Applying The Multimedia Development Life Cycle Method

[1]Noferianto Sitompul, [2]Vanie Wijaya, [3]U Heri Mulyanto
[1,2,3]Teknik Multimedia, Manajemen Informatika, Politeknik Negeri Sambas
Email: noferiantositompul@gmail.com[1], poltesa.vaniewijaya@gmail.com[2], uray_heri@yahoo.com[3]

Keywords

Virtual Tour
Polytechnic
MDLC

Abstract. Sambas State Polytechnic is a state university located in West Kalimantan, precisely in Sambas Regency, which is also a tertiary institution that is of interest to the people of Sambas Regency, which must have an attraction in terms of adequate information facilities. The Sambas State Polytechnic socialization (public relations) team uses PowerPoint slides, video visualization, social media, and internet media to present the Sambas State Polytechnic's profile and its nine study programs to potential high school and Madrasah Aliyah graduate students in various districts and cities in West Kalimantan Province to increase the number of students. Then, in introducing the campus area or environment to prospective students, you still need to take a manual tour around the campus area you are going to. This calls for innovation in new digital-based socialization media in the form of a virtual tour, which can accurately portray the state of the Sambas State Polytechnic, from the campus entrance to the learning support study program rooms. The virtual tour can be accessed online via a computer or mobile device, allowing people to view the original campus environment without traveling far. A virtual Tour is a digital technology innovation whose working process mechanism changes place objects or locations into digital images that can be accessed via computer devices. The Multimedia Development Life Cycle (MDLC) technique, comprising six stages—concept, design, data collecting, creation, testing, and distribution—was utilized to develop this virtual tour application. This method was chosen because it is a very familiar multimedia method for creating Virtual Tour applications. Creating this application it is hoped that it will provide benefits, namely making it easier for visitors and prospective students to get to know the Sambas State Polytechnic campus with digital simulations and implementing digital simulations on the Sambas State Polytechnic campus, which can be accessed via a web browser application.

1. INTRODUCTION

The digital technology being developed significantly impacts human life; one example is the Virtual Tour. A virtual tour is a form of digital technology innovation whose working process mechanism changes place objects or locations into digital images that can be accessed via computer devices using motion control, line tracking, and point tracking to simplify the process of recognizing places or locations into a digital simulation [1] [2][3]. Several media are used to implement virtual tours, namely 360° video and 360° multi-image panorama [4][5]. The difference between the two is only in the control process displayed, owned by the multi-image panorama 360^0 [6]. The access process can be via the website or with Virtual Reality tools.

Virtual Tours are currently widely used in the business and academic fields. In the business sector, virtual tours can promote tourist attractions by displaying the conditions of a tourist attraction [7] [8]. For example, Sambas State Polytechnic uses virtual tours to help visitors and potential students find the location of the buildings and structures they are visiting. In the meantime, virtual tours can be used in the academic field to introduce an educational institution's floor plan, location, and facilities [9]. Sambas State Polytechnic is a state university located in West Kalimantan, precisely in Sambas Regency, which is also a tertiary institution that is of interest to the people of Sambas Regency, which must have an attraction in terms of adequate information facilities.

Currently, Sambas State Polytechnic has three departments with 9 study programs. From 3 majors and 9 study programs until 2023, the number of Sambas State Polytechnic students is 1854. The Sambas State Polytechnic socialization (public relations) team uses PowerPoint slides, video visualization, social media, and internet media to present the Sambas State Polytechnic's profile and its nine study programs to potential high school and Madrasah Aliyah graduate students in different districts and cities in West Kalimantan Province to increase the number of students. Then, you still need to give potential students a manual tour of the campus area you are visiting to introduce them to

the campus area or surroundings. This calls for innovation in new digitally based socialization media that can accurately portray the state of Sambas State Polytechnic, from the campus entrance to the virtual study rooms for learning support. These virtual spaces can be accessed online via computers and mobile devices, allowing people to view the original campus environment without traveling far [10].

Apart from that, based on direct searches via the internet, there are no campuses in West Kalimantan province that have included digital campus information applications in the form of virtual tours on their official websites. For this reason, it is necessary to create an innovation, especially on the Sambas State Polytechnic campus, by creating a virtual campus tour, where people will be able to see the actual situation of the campus without needing to come directly to campus. Developing the Sambas State Polytechnic virtual tour application is a follow-up step to previous research regarding creating virtual tours for the Informatics Management department. In addition to being a virtual digital medium to assist school accreditation, the Virtual Tour application was developed to socialize incoming students [11]. The implementation of the Virtual Tour begins with taking pictures using a 360 camera. It is applied to a website to help make it easier for prospective new students or visitors to the Sambas State Polytechnic in the form of a visual demo regarding the layout of the buildings and campus environment of the Sambas State Polytechnic as realistically as possible, which can be accessed anywhere and anytime. On the available website [12]. The Multimedia Development Life Cycle (MDLC) technique, comprising six stages—concept, design, data collecting, creation, testing, and distribution—was used to develop this virtual tour application. This approach was used since it is a well-known multimedia technique for developing Virtual Tour applications [13][14].

This research aims to introduce the Sambas State Polytechnic campus to new students and visitors with digital simulations and implement digital simulations on the Sambas State Polytechnic campus, which can be accessed via a web browser application. By creating this application, it is hoped that it will provide benefits, namely making it easier for visitors and prospective students to find the room or place they are going to and creating a more precise and more realistic method with a Virtual Tour [15].

2. METHOD

The MDLC approach is used during the research phases of creating a virtual tour based on virtual reality. The MDLC method's research phases consist of the following:

1. Concept
   At this stage, a virtual tour application design concept will be created which will be created by first analyzing the panoramic environment that will be included in the Virtual Tour application.
2. Design
   Creating a display design model for the campus virtual tour application completes the design stage. in the form of location maps, menu styles, navigation buttons, and a list of thumbnails for panoramic images.
3. Collection of materials
   Materials, including clipart pictures, animations, and sounds, are gathered, and graphic images, pictures, and other items required for the following phase are also created. This study's primary data source is a 360-degree panoramic image captured directly through photography.
4. Manufacturing
   This step integrates all the data from each of the 360^0 panoramic photos that were created into the 3DVista Virtual Tour application, creating a temporary display of the campus virtual tour application along with an instruction manual.
5. Testing
   At this point, we describe evaluation tests on the virtual tour application and explain user reaction testing. An assessment questionnaire tests whether the application is appropriate, and responses are recorded on a Likert scale.
6. Distribution

At this stage, a virtual campus tour application has been obtained, suitable for use as digital media and a simulation of the Sambas State Polytechnic campus environment.

3. RESULTS AND DISCUSSION

Before presenting the findings as a virtual tour, a few steps need to be completed after the research phases utilizing the MDLC approach, specifically:

1. Concept: At this point, the primary issue was identified as the lack of a thorough visualization that depicted the Sambas State Polytechnic's learning support facilities, including study rooms, labs, and other related spaces. The next step is to design the format for the virtual tour, which will support a 3600 image of the facilities taken with a 3600 camera that is acquired directly. The tour begins at the main campus entrance and proceeds to the student residence building. Below is one of the 3600 images:

Figure 1. 360^0 Front Page Image

2. Design. Currently, the Sambas State Polytechnic virtual tour application's display design model is created. This virtual tour application's display design model is:

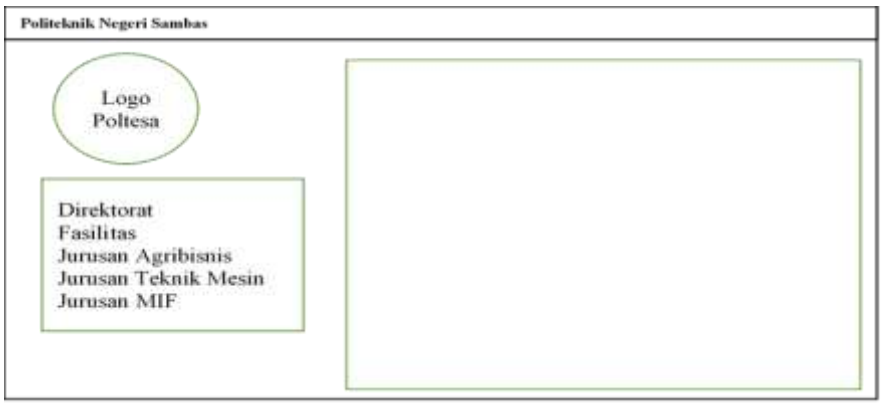

Figure 2. Sambas State Polytechnic Virtual Tour's First Display Design

3. Collection of Materials. At this stage, a 360^0 panorama image was taken. The environment of the Sambas State Polytechnic can be seen in the following image display:

Figure 3. Taking pictures

4. Manufacturing. At this point, a virtual tour is created using the 3DVista Virtual Tour application. Information is presented in the virtual tour as a series of thumbnail panoramic photos and navigation buttons. The following image illustrates the manufacturing process:

Figure 4. Creating a Virtual Tour in the 3DVista Virtual Tour Application

4. Testing

At this stage, testing was conducted using an assessment questionnaire for three material experts and 18 lecturers from 9 programs, which were measured using a Likert scale. This stage has not yet been completed and will soon be in the next plan. The results of material expert assessments that have been converted into percentages are presented in the figure below:

Name	Question Item								Total Score	Maximum Score
	1	2	3	4	5	6	7	8		
Wijaya	5	4	4	4	5	4	4	5	35	40
Harmoko	5	4	4	5	5	5	4	5	37	40
Ari	4	4	4	4	5	4	4	5	34	40
Total									106	120
Average									35,333	40
Percentage									88,3	

Figure 5. Material Expert Assessment Results

Then, proceed with the assessment of 30 people in the community; the results of the community assessment are obtained, which have been converted into percentages, which are presented in the figure below:

Number	Name	Question Item								Total Score	Maximum Score
		1	2	3	4	5	6	7	8		
1	Wina	4	4	5	4	5	4	4	5	35	40
2	Malini	4	4	5	4	4	4	4	4	33	40
3	Kurniasari	5	4	5	4	3	3	4	4	32	40
4	Ariyani	4	4	5	4	4	4	4	4	33	40
5	Astuti	4	5	5	5	4	5	4	5	37	40
6	Hanipah	4	4	5	4	5	5	4	4	35	40
7	Alghifari	4	4	5	4	4	5	5	5	36	40
8	Amin	4	5	5	4	4	4	4	4	34	40
9	Pratama	4	4	5	4	5	4	4	4	34	40
10	sihkin	4	4	5	4	4	4	4	4	33	40
11	Lestari	4	4	5	3	3	4	4	4	31	40
12	Ledi	4	4	5	4	4	4	4	4	33	40
13	Rezeki	5	5	5	5	5	5	4	4	38	40
14	Hadi	4	4	5	4	4	4	5	5	35	40
15	Hendro	4	4	5	4	4	4	5	4	34	40
16	NurHab	4	4	5	4	4	3	5	4	33	40
17	Irfandi	4	4	5	4	4	4	4	4	33	40
18	Dwi Diyanti	5	4	5	4	4	4	4	4	34	40
19	Reni	5	4	5	5	5	4	5	5	38	40
20	Ashari	4	5	5	5	4	4	4	5	36	40
21	Nur Indah	4	5	5	4	3	4	4	4	33	40
22	Mulya	4	4	5	4	3	5	4	4	33	40
23	Fascal	5	5	5	4	3	4	4	4	34	40
24	Khaerul	5	5	5	5	4	4	5	5	38	40
25	Pardila	5	5	5	5	5	5	5	5	40	40
26	Hesti	5	4	5	4	4	4	4	4	34	40
27	Candra	5	4	5	4	4	4	4	4	34	40
28	Nurcahya Medina	4	5	5	5	3	4	4	5	35	40
29	Ghefira	4	5	5	4	4	4	4	5	35	40
30	Ariel	4	4	5	5	5	5	5	5	38	40
					Total					1041	1200
					Average					34,70	40,00
					Percentage					86,75	

Fiqure 6. Community Assessment Results

Based on three material experts' evaluations of each factor listed in the table. One received an average rating of 88.3%. For the assessment of 30 people, the community received an assessment of 86.75%. The conclusion of the validation results is in the "Agree" category, and the Sambas State Polytechnic virtual tour application is declared suitable for use as a digital information medium.

5. Distribution

At this stage, a virtual campus tour application has been obtained, suitable for use as digital media and a simulation of the Sambas State Polytechnic campus environment.

Figure 6. Display of the Sambas State Polytechnic Virtual Tour Application

4. CONCLUSION

The following are inferences that can be made from this study: Using the MDLC approach, a virtual tour was created for the Sambas State Polytechnic that serves as a digital information medium for all of the school's study programs. Based on the evaluation outcomes from subject matter experts (88.3%) and students (86.75%), it can be inferred that the Sambas State Polytechnic virtual tour application is highly appropriate for usage as a digital information resource.

REFERENCES

[1] R. Nulhakim, R. Reza El Akbar, and F. M. Nursuwars, "Virtual Tour Pengenalan Area Universitas Siliwangi dengan Multi Image Panorama 360 0 Korespondensi," *Sci. Artic. Informatics Students*, vol. 3, no. 2, pp. 145–151, 2020, [Online]. Available: https://publikasi.unsil.ac.id/index.php/sais.

[2] N. Safriadi, H. Sastypratiwi, and N. Tamara, "Aplikasi Virtual Tour Berbasis Multimedia Interaktif Pada Objek Wisata Qubu Resort Pontianak," *Semin. Nas. Teknol. Inf. Dan Komun. X*, pp. 411–416, 2018.

[3] A. Suhendar and A. Fernando, "Aplikasi Virtual tour Berbasis Multimedia Interaktif Menggunakan Autodesk 3Ds Max," *ProTekInfo(Pengembangan Ris. dan Obs. Tek. Inform.*, vol. 3, no. 1, pp. 30–35, 2017, doi: 10.30656/protekinfo.v3i0.55.

[4] A. Choiron, "Aplikasi Virtual Tour Dinamis Pada Universitas Dr. Soetomo Surabaya Berbasis Web," *Inf. J. Ilm. Bid. Teknol. Inf. dan Komun.*, vol. 2, no. 1, 2017, doi: 10.25139/inform.v2i1.406.

[5] S. Riyadi and I. Nurhaida, "Aplikasi Sistem Virtual Tour E-Panorama 360 Derajat Berbasis Android Untuk Pengenalan Kampus Mercu Buana," *J. Teknol. Inf. dan Ilmu Komput.*, vol. 9, no. 1, p. 17, 2022, doi: 10.25126/jtiik.2021864209.

[6] I. P. Dewi, A. Prasetyo, M. Giatman, W. Wakhinuddin, and A. D. Samala, "Design and Build Virtual Tour Panorama 360 Hospitality Center Unp As Promotional Media," *Sinkron*, vol. 7, no. 1, pp. 17–25, 2022, doi: 10.33395/sinkron.v7i1.11199.

[7] P. Agustine, "Pengembangan Interactive Virtual Tour PT. Schneider Electric Manufacturing Batam," *J. Appl. Multimed. Netw.*, vol. 4, no. 1, pp. 43–56, 2020, doi: 10.30871/jamn.v4i1.2109.

[8] H. Respatiningsih and B. Kurniawan, "Penerapan Virtual Tour Sebagai Strategi Promosi di Era New Normal (Studi Kasus di Destinasi Digital Pasar Inis Purworejo)," *Semin. Nas. Kepariwisataan*, vol. 1, no. 1, pp. 83–94, 2020.

[9] I. P. Arosi, F. R. Pradhana, and D. Muriyatmoko, "Virtual Tour Design In Egypt Building

Darussalam Gontor Putri University," *Procedia Eng. Life Sci.*, vol. 2, no. 1, pp. 1–5, 2021, doi: 10.21070/pels.v2i0.1170.

[10] A. F. Ulva, "VISUALISASI 3D PAMERAN DENGAN KONSEP VIRTUAL REALITY BERBASIS WEB DAN MOBILE," pp. 68–80, 2022.

[11] T. F. Prasetyo, A. Bastian, and H. Sujadi, "Optimalisasi Penerapan Teknologi Virtual Reality Tour Kampus Universitas Majalengka Menggunakan Metode Multimedia Development Life Cycle," *INFOTECH J.*, vol. 7, pp. 15–28, 2021, doi: 10.31949/infotech.v7i2.1313.

[12] N. Sitompul and V. Wijaya, "Development Of Informatics Management Virtual Tour As Digital Information Media Using The Addie Method," *Infokum*, vol. 10, no. 5, pp. 384–389, 2022, [Online]. Available: http://seaninstitute.org/infor/index.php/infokum/article/view/938%0Ahttp://seaninstitute.org/infor/index.php/infokum/article/download/938/739.

[13] F. Umafagur, S. R. Sentinuwo, and B. A. Sugiarso, "Implementasi Virtual Tour Sebagai Media Informasi Daerah (Studi Kasus : Kota Manado)," *J. Tek. Inform.*, vol. 9, no. 1, 2016, doi: 10.35793/jti.9.1.2016.13456.

[14] N. Sitompul, "Multimedia Development Life Cycle Method In Village Infographic Video," vol. 6, no. 36, pp. 2431–2439, 2022.

[15] M. Santoso, C. R. Sari, and S. Jalal, "Promosi Kampus Berbasis Augmented Reality," *J. Edukasi Elektro*, vol. 5, no. 2, pp. 105–110, 2021, doi: 10.21831/jee.v5i2.43496.