Application of Villamil-Molina in Virtual Reality Environmental Information on The ITPLN Campus

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Abstract

This study aims to apply Virtual Reality (VR) as an information medium in the ITPLN campus environment, focusing on the Villamil-Molina analysis method. The 3DVista app will be used as a VR content development platform. The research will evaluate accessibility, educational effectiveness, user acceptance, content availability, financial aspects, security, privacy, and environmental impact. The study results are expected to provide an in-depth understanding of the potential of VR, identify obstacles, and present recommendations to improve its implementation in the ITPLN campus environment by utilizing 3DVista applications. Villamil-Molina follows structured steps, uses the right creativity, and provides a satisfying experience for users.

Keywords*: Virtual Reality, Villamil-Molina, 3DVista*

Abstrak

Penelitian ini bertujuan untuk menerapkan Virtual Reality (VR) sebagai media informasi di lingkungan kampus ITPLN dengan fokus pada metode analisis Villamil-Molina. Aplikasi 3DVista akan digunakan sebagai platform pengembangan konten VR. Penelitian tersebut akan mengevaluasi aspek aksesibilitas, efektivitas pendidikan, penerimaan pengguna, ketersediaan konten, aspek keuangan, keamanan, privasi, dan dampak lingkungan. Hasil penelitian diharapkan dapat memberikan pemahaman mendalam mengenai potensi VR, mengidentifikasi kendala, dan menyajikan rekomendasi perbaikan implementasinya di lingkungan kampus ITPLN dengan memanfaatkan aplikasi 3Dvista. Villamil-Molina mengikuti langkah-langkah terstruktur, menggunakan kreativitas yang tepat, dan memberikan pengalaman yang memuaskan bagi pengguna.

Kata-kata kunci: Virtual Reality, Villamil-Molina, 3DVista

1. Introduction

Virtual Environment (VE) is a form of human-computer interaction consisting of audio and visual simulations of three-dimensional (3D) space created by computers, where users can have interactive experiences. In this 3D space, users can communicate with each other, react to the surrounding environment, change the aesthetic experience of the environment, control the movements of their avatars, and change the characteristics of the environment. Virtual Environment (VE) is also known as virtual Reality (VR) [1].

Virtual Reality is the appearance of three-dimensional images made by computers to look real with the help of certain equipment, making the user seem to be directly physically involved in the environment [2]. Several VR roles, such as simulation, interactive learning, promotion, and games, are increasingly being developed [3].

The advances offered by virtual reality technology do not always get a positive response; parties still oppose using Virtual Reality. People who oppose the use of virtual Reality are usually based on a lack of understanding of the technology and possibilities of virtual Reality itself. Virtual reality technology developed rapidly in the 1965s, providing location information limited primarily to verbal, video, or other two-dimensional forms such as maps, brochures, etc. This type of information transmission certainly has advantages and disadvantages. Two-dimensional forms, communication methods commonly used in the teaching and learning process, certainly have weaknesses because the information conveyed needs to be more varied and interactive. Although the video can represent a position interactively compared to the 2D form, it is even less interactive because it does not provide feedback or input [4] [5].

Videos are believed to provide better effectiveness than photos because they blend moving images with sound to make them attractive [6]. This research will use the Villamil-Molina method so that the process of making a 360° virtual tour will be produced with appropriate and sequential multimedia techniques to create a good quality virtual tour. The Villamil-Molina method consists of several stages: development, pre-production, production, post-production, and delivery [7]. The Villamil-Molina approach is widely used for multimedia creation, which requires detailed planning, multimedia technology, and sound production management; this fits with the research conducted [8].

This study utilizes VR technology to produce information media for users in campus buildings. Research objects used by the campus of the Institute of Technology.

2.   Method

The Villamil-Molina method states that multimedia development can be successful if several things are fulfilled, such as good planning, mastering multimedia technology, and mastering production management **[7]**. In addition, the Villamil-Molina method also provides stages of multimedia development, namely, development, pre-production, production, post-production, and delivery **[9] [10]**. Villamil-Molina workflow is presented in **Figure 1**.

Development	→	Pre-Production	→	Production	→	Post-Production	→	Delivery

Figure 1. Villamil-Molina Workflow

At this stage, development focuses on developing concepts and objectives for application development. Pre-production, the second stage after the development phase, focuses on creating navigation structures and storyboards. At this stage, attention is also paid to the need for devices to manufacture multimedia products. After the pre-production stage is passed, this stage can be done. Activities related to this stage are shooting, editing, and rendering so that it becomes a product ready to be tested. Post-production, at this stage, multimedia product development enters the alpha and beta testing stages. Delivery: This stage is the final stage in the Villamil-Molina method of publishing products; publication can be done in several ways, namely through presentation and via the Internet.

Many studies have used the Villamil-Molina approach, such as those conducted by Alataes in designing motion graphics advertising for Garuda cashier application services [8], making films **[11]** , and making learning animation **[12]**. Based on this, this study tries to apply the Villamil-Molina approach to making virtual Reality around the ITPLN campus. 3DVista is a virtual staging software that aims to create exciting panoramas and Virtual Reality (VR) content. This software allows us to create spectacular panoramas and multimedia virtual tours intuitively and fast **[13]**. **Figure 2** is a symbol of 3D Vista.

Figure 2. 3Dvista

This research uses the Villamil-Molina method to create a 360-degree virtual reality ITPLN campus environment in the west and east lobby on the first floor of the ITPLN building. A laptop with CPU specs serves as the project's hardware, operating system: Windows 10 Professional 64-bit; Processor: Intel(R) Core (TM) i7-10510U CPU @ 1.80GHz 2.30 GHz; RAM: 8GB DDR4; SSD: 512GB; GPU: Nvidia GeForce MX130 2GB. As for the software, 3DVista is being utilized for this research. All photos were taken with an Insta360 ONE X2 (F2.0, 7.2mml). All images on the dataset taken using the insta360 tool get high-resolution results aimed at producing good-quality VR results, as shown in **Figure 3**.
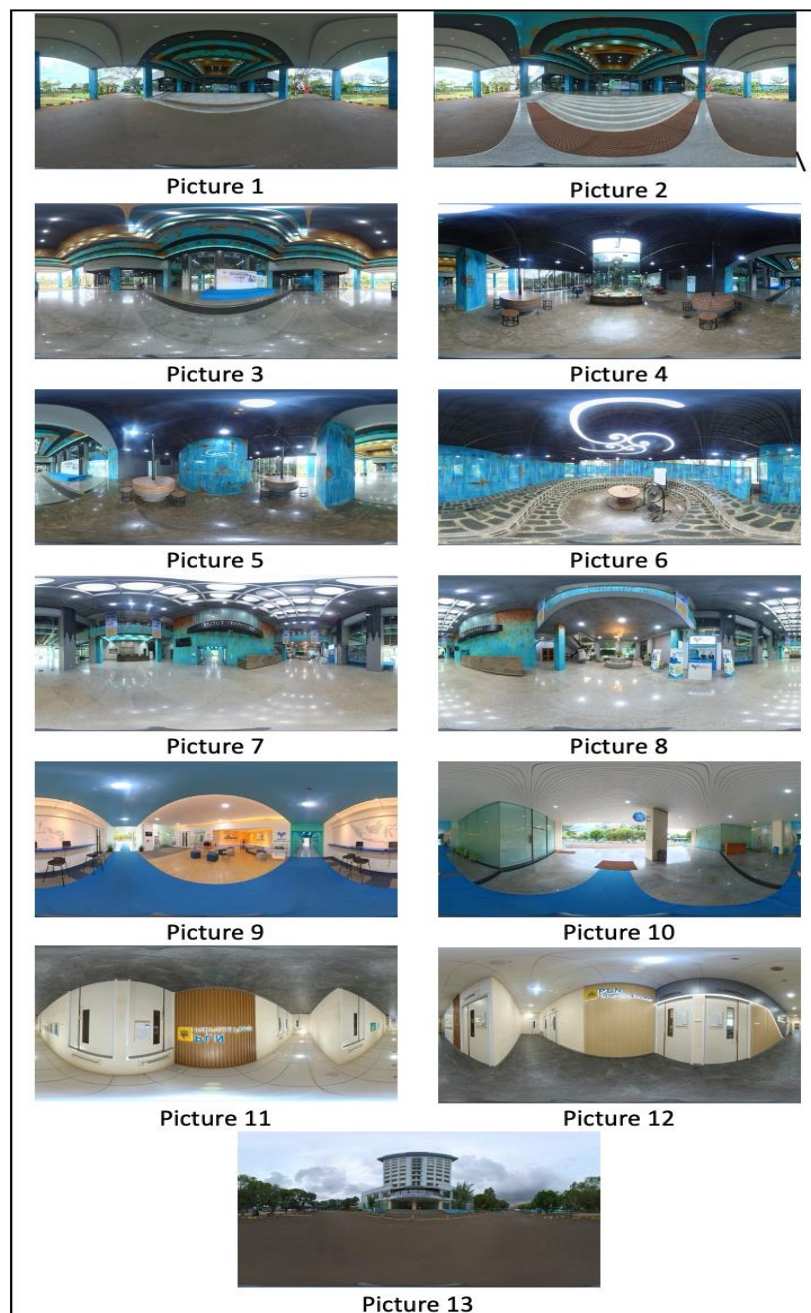

Figure 3. Example of picture Dataset

3.   Results and Discussion

The interface's implementation, application testing under various circumstances and a discussion are covered in this section.

3.1 Development

In this phase, the VR concept to be developed began to take shape based on existing ideas, targets set on the 1st floor and lobby of the PLN Institute of Technology, and the funding used to make VR using internal grants.

3.2 Pre-Production

At this stage, dataset images are taken, as shown in Figure 3 above, making storyboards that aim to help structure the navigation and interaction needed in VR experiences. This includes placing navigation buttons, interactive objects, or focal points to aid in VR creation. The navigation position is presented in **Figure 4.**
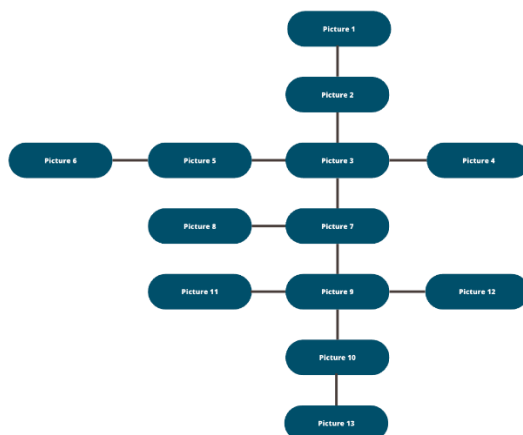

Figure 4. Navigation position

3.3 Production

At this stage, the activity is editing using the 3DVista application to become a product ready to be tested. The first step is to import all the dataset images into the 3dVista application. The import picture is presented in **Figure 5**.
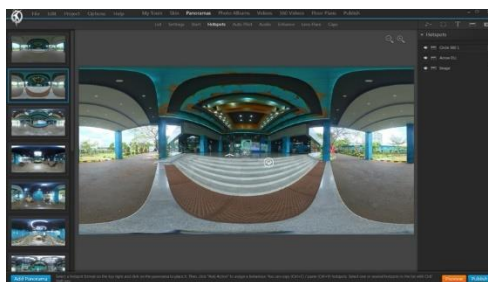

Figure 5. Import Picture

After importing images into the 3Dvista application, the photos are arranged according to the navigation position in **Figure 5**, and navigation buttons are made on each image—the navigation buttons move from one image to another. Navigation buttons are presented in **Figure 6.**
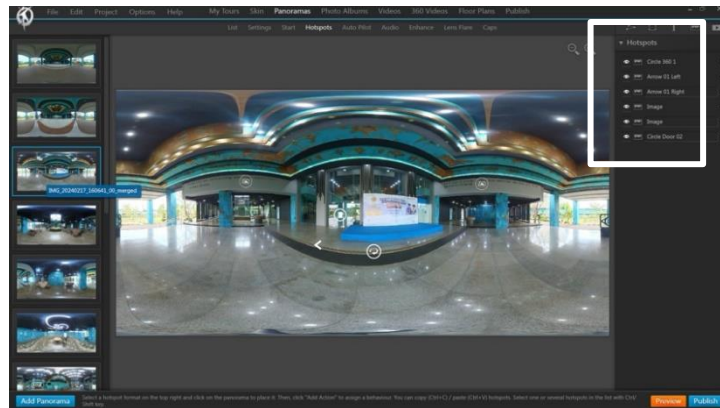

Figure 6. Navigation Buttons

3.4 Post-production

Tests are carried out thoroughly across various devices and platforms to ensure their quality and make improvements if needed. At this testing stage, the extent to which VR is intentional is tested to ensure that VR produces the expected output. The testing result is presented in **Figure 7.**
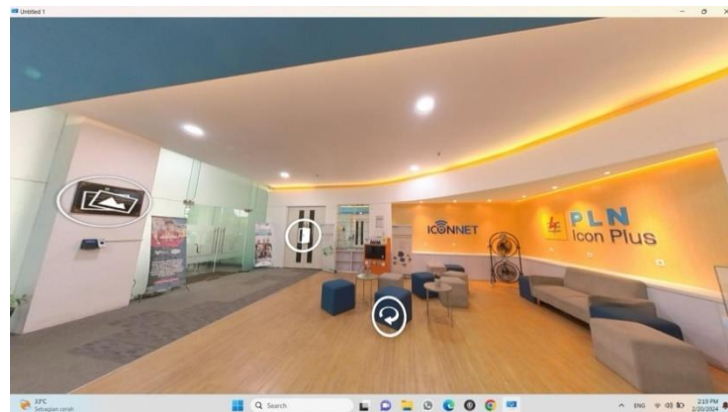

Figure 7. Testing result

3.5 Delivery

In this final stage, the results of the VR Tour 360 are delivered. Virtual Tour Files can be saved in formats compatible with the platform used for publication, such as HTML5 for the web, APK for Android apps, or EXE for desktop apps, and Embed Codes can easily embed virtual tours directly into your website, blog, or other platforms. From the results of tests that

have been carried out on various tools and platforms for use on YouTube, the web, oculus, and Apple Vision pro, has been successfully carried out, the Villamil-Molina Workflow approach combined with 3Dvista is entirely satisfactory. However, the research results are still limited to one floor in the ITPLN building; this certainly needs to be improved on all floors or other environments around the campus.

4. Conclusion

The results showed that the virtual tour created using the Villamil-Molina method followed structured steps, used the right creativity, and provided a satisfying experience for users. By adding interactive features such as hotspots, navigation, and additional information, users can explore the 360-degree environment with ease and enjoy an immersive experience.

References

[1] R. Munadi, "Penerapan Metode Perancangan Virtual Reality: Tinjauan Literatur Metode Kaur, Metode Polcar, Metode Virtual Reality Interface Design (VRID), Virtual Environment, Virtual Reality," JalanTgk. Syech Abdurrauf, vol. 5, no. 2, 2021, doi: 10.30743/infotekjar.v5i2.3458.

[2] H. Ghina Almira, P. Studi Teknologi Informatika Multimedia Digital, J. Teknik Komputer, P. Negeri Sriwijaya, J. Srijaya Negara Bukit Besar, and S. Selatan, "Penggunaan Teknologi Virtual Reality pada Media Pembelajaran Mata Kuliah Fotografi Dasar," 2021.

[3] H. Thuan To Saurik, D. Dwi Purwanto, J. Irawan Hadikusuma, P. Studi Desain Komunikasi Visual Sekolah Tinggi Teknik Surabaya, and P. Studi Sistem Informasi Sekolah Tinggi Teknik Surabaya, "TEKNOLOGI VIRTUAL REALITY UNTUK MEDIA INFORMASI KAMPUS," vol. 6, no. 1, pp. 71–76, 2019, doi: 10.25126/jtiik.201961238.

[4] A. T. Fardani, "E-Tech Penggunaan Teknologi Virtual Reality Untuk Sekolah Menengah Pertama Pada Tahun 2010-2020", doi: 10.1007/XXXXXX-XX-0000-00.

[5] S. Purnamasari and T. Herman, "PENGGUNAAN MULTIMEDIA INTERAKTIF TERHADAP PENINGKATAN KEMAMPUAN PEMAHAMAN DAN KOMUNIKASI MATEMATIS, SERTA KEMANDIRIAN BELAJAR SISWA SEKOLAH DASAR," 2016.

[6] "Clarine, Brenna. (2016). 11 Reasons Why Video is Better. [Internet]. Tersedia di https://www.advancedwebranking.com/blog/11-reasons-why-video-is-better/. Diakses Pada 9 November 2019".

[7] "Binanto, Iwan. (2013). Perbandingan Metode Pengembangan Perangkat Lunak Multimedia. In Prosiding Seminar RiTekTra 2013. Teknik Informatika, Fakultas Sains dan Teknologi. Universitas Sanata Dharma".

[8] S. Shakila Alatas Teknik Multimedia and P. Negeri Batam, "PERANCANGAN MOTION GRAPHIC IKLAN LAYANAN APLIKASI GARUDA KASIR SEBAGAI MEDIA PROMOSI DI SOSIAL MEDIA," *Journal of Applied Multimedia and Networking (JAMN)*, vol. 4, no. 2, 2020, [Online]. Available: http://jurnal.polibatam.ac.id/index.php/JAMN

[9] Fauzan Dianta, A., Devi, C., Sarinastiti, W., & Akbar, Z. F. (2023). MEDIA PEMBELAJARAN INTERAKTIF BERBASIS VIRTUAL REALITY MENGGUNAKAN VIDEO 360° . *POSITIF : Jurnal Sistem Dan Teknologi Informasi*, *9*(1), 21–28. https://doi.org/10.31961/positif.v9i1.1560

[10] Muhammad Aldryansyah Pamungkas, Amelia Setya Puspa, Ratu Hasna Tsana Khoerunnisa, & Amata Fami. (2023). Efektivitas Kinetic Typography dalam Pembuatan Motion Graphic "Tingkatkan Skor TOEFL® ITP, Join LIA". *Nusantara Journal of Multidisciplinary Science*, *1*(5), 1157–1171. https://doi.org/10.60076/njms.v1i5.196

[11] M. Adam, F. Az, M. Fajri, and A. Nasrullah, "IMPLEMENTASI TEKNIK ROTOSCOPING PADA PEMBUATAN FILM PENDEK BERGENRE THRILLER MENGGUNAKAN METODE VILLAMIL-MOLINA," *JOURNAL OF APPLIED MULTIMEDIA AND NETWORKING*, vol. 2, no. 2, pp. 1–12, 2018.

[12] M. F. Sholahuddin and A. Firdaus, "PEMBUATAN DAN PENERAPAN ANIMASI PEMBELAJARAN DENGAN MENGGUNAKAN METODE VILLAMIL - MOLINA," *Jurnal Laporan Akhir Teknik Komputer*, vol. 2, no. 1, pp. 86–93, Sep. 2022.

[13] "3DVista. (2018). 3DVista Virtual Tour FAQs. [Internet]. Tersedia di https://www.3dvista.com/en/support/faq. Diakses Pada 16 November 2019".