Web-Based Interactive Virtual Tour as an Information Media and Introduction to Post-Pandemic Lecture Buildings at Universitas Lampung

P Kurniawan [1*], I Nugroho [1], and AC Nugroho [1,]

[1] *Department of Architecture, University of Lampung, Jl. Prof. Soemantri Brojonegoro, No. 1 1st Floor, Building B, Architecture Department, Faculty of Engineering, Bandar Lampung 35145, Indonesia*

[*] *Corresponding e-mail: panji.kurniawan@eng.unila.ac.id*

Article Information:

Received:
6 September 2022

Received in revised form:
22 November 2022

Accepted:
22 December 2022

Volume 4, Issue 2, December 2022
pp. 94 – 99

https://doi.org/10.23960/jesr.v4i2.115

Abstract

This study aims to determine the effectiveness of architectural communication methods using a link embedded in online media or social media. This research method is an interactive communication simulation in the form of a Virtual Tour using the 360o panoramic image method. A 360o panoramic image is multiple images combined to get a wider, more detailed image. Panorama images will be set using software and then uploaded to a website's database. The public, in this case more concerned with the academic community, can easily get information about the shape of buildings and spaces from various predetermined points, without installing certain 3D Architecture software. It is enough to use a computer or smartphone based on iOS or Android and without using object tracking or the like to activate communication, because it is web-based, it can be easily accessed anywhere and anytime as long as the user has the intended link. This is an alternative media in providing information about the object, which in this case is the Lecture Building to the public, especially students and parents during the post-pandemic period.

Keywords: *Architectural communication, virtual tour, 360º panoramic image*

I. INTRODUCTION

Unforeseen circumstances in the form of an outbreak of the Covid-19 disease have brought urgent changes to various sectors. The development of the virus quickly spread throughout the world. Every day data in the world reports the increasing scope and impact of covid-19. Indonesia is also in a state of national emergency. The number of positive cases of Corona and the death rate have been increasing day by day since it was announced for the first time in March 2020 by President Joko Widodo [1]. This affects policy changes and reforms to be implemented, including the world of education [2]. The COVID-19 pandemic has caused not only the risk of death from the viral infection but also unbearable psychological stress to people throughout the world [3]. The government's advice to stay at home and physical and social distancing must be followed by changing the face-to-face learning model to online, this also affects the new student orientation period which is also carried out online which causes new students to be less familiar with their new campus [4].

In 2022, the decline has begun to appear, and lecture activities have started to be carried out offline, but activities are still limited, especially the maximum number of students for the size of the lecture hall. And post-pandemic conditions will still be a challenge going forward considering the number of students who will enter the University of Lampung will continue to grow. Therefore, this research tries to raise some of these problems in an effective interactive architectural communication, and can be accessed by anyone, anywhere, anytime, only through a link and smartphones with various OS, without the need for devices with special specifications.

The purpose of this research are:

1. Providing other alternative ways of communicating and interacting in view of the

conditions and facilities of lecture buildings, during the post-pandemic period.
2. Adapting IoT in the presentation of Visual Architecture.
3. Make it easier for the public, especially students, prospective students and parents to get to know the campus where they will study.

The urgency of this research activity is very high considering the current conditions of communication that are carried out have limitations in meeting freely like before the pandemic. Meanwhile, a condition is needed where clarity of information is highly demanded in an Introduction to Campus presentation.

II. MATERIALS AND METHODS

Data collection methods (primary and secondary) in this study used a combined method of observation (observation), collection of survey photographs and existing floor plans, environmental condition photography, two-dimensional depiction and interviews with the owner. The observation method is carried out by researchers to observe and know directly (visually) research objects at research sites by taking primary data which is realized through an image recording device (digital camera) which in this case uses a special camera that records in a 360º panoramic image format.

At this stage a questionnaire will also be distributed with questions asked to respondents regarding knowledge about the Building B, Architecture, Faculty of Engineering, University of Lampung.

The materials needed in this research are measuring data on the existing location in the form of building plans and spatial information and documentation in the building which will be included in the Virtual Tour data.

In the implementation of this research activity using several tools that support the process of obtaining data [5]. The tools used include:

1. Graphical data processing computer with Minimum Proc CPU specifications. Intel ® Core ™ i7-5930K CPU @3.5GHz (12CPU), 65536MB RAM, N-VIDIA MSI RTX 3080 Graphics Card with (VRAM) 10077MB, which will be used in the Virtual Tour editing process.
2. Camera 360o Ricoh Theta SC2 with resolution specifications of 12MPx2, 5376×2688 still image resolution, 14GB, ISO sensitivity (standard output sensitivity) Still image: (Automatic) ISO64 - 1600 The Upper Limit settings, (ISO priority mode) ISO64 - 3200 *1 (Manual mode) ISO64 - 3200 *2, Video: (Automatic) ISO64 - 6400 The Upper Limit settings, which will be used in documenting images in the building space.
3. Laser Distance Meter to measure the existing condition of existing land and buildings.

The availability of the above tools requires data processing using two software:

1. CorelDraw, this software has particular uses in architectural design, interior design and landscape design [6]. Another two-bit graphic design tool is Corel Draw, a graphic software developed by Corel Canada, which is widely used in the advertising industry. functions, etc. Usually in landscape design and production, editing functions such as plan modification, copying and deletion are involved, and Corel DRAW's editing commands are very easy to learn [7]. This software will be used to create symbols, photos of room users, room names and other information about the building.
2. Autocad, Guang Sheng et al. [8] proposed that in the choice of computer-aided design software to draw the landscape map, mainly computer-aided design software has the following advantages, first of all, the drawing size proportional coordination, high precision, followed by a significant reduction in drawing time, colorful, intuitive and realistic effects, and easy to modify, carry, save, reusable, etc., which greatly improves the efficiency of work in complex landscape design. In the drawing of floor plans.

III. RESULTS AND DISCUSSIONS

A. Tracing Data

It begins with tracing existing data, by looking, measuring and analyzing the existing space. The location in this research is Building B, Faculty of Engineering, Unila. The first data that needs to be obtained is the plan from the 1st and 2nd floors of building B (see Figure 1 and Figure 2).

This data is obtained by measuring using a laser distance. Measurements are made to the rooms that are deemed necessary, especially spaces that will be published to the public. This floor plan data will become the key plan when the Virtual Tour is run.

The next process is taking documentation in the form of photographs of the rooms in the building. Photos that will become data for processing in the virtual tour are photos with 360º image format. There are several ways of getting a 360º image.

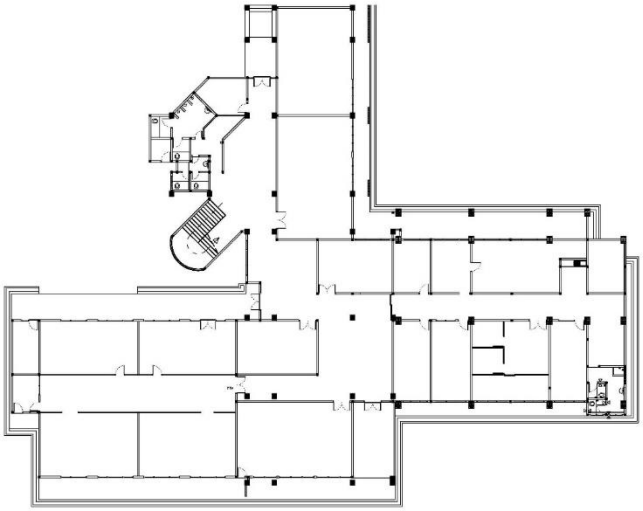

Figure 1. Existing 1st floor plan.

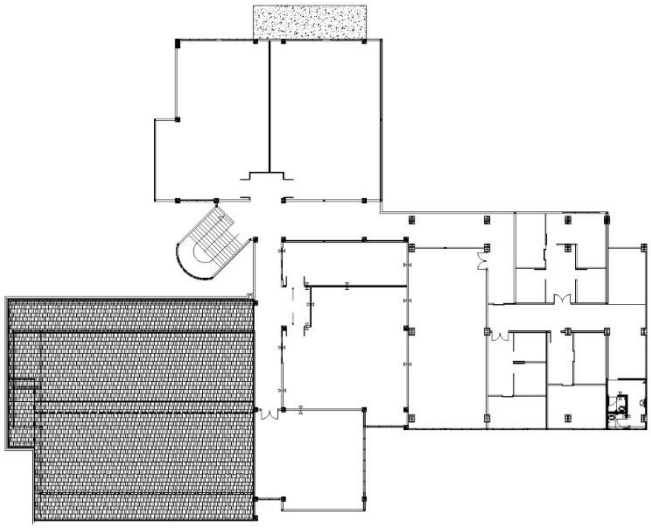

Figure 2. Existing 2nd floor plan.

One simple way is by using an ordinary camera and then processing it using image stitching techniques [9]. But in this study the image was taken using the Ricoh Theta SC2 Camera.

The use of this type of camera will shorten the 360º image data collection because there is no need to combine images with stitching techniques. The data obtained will immediately be in the form of a 360º image. which can be directly processed using the Virtual Tour software [10].

There are several 360º images that are deemed necessary to be displayed including 11 images on the 1st floor and 9 images on the 2nd floor. The 360º image type obtained is an image with a panoramic type. For more details, see some of the Figures below.

Figure 3. Panoramic Picture of the Entrance Area from Building A

Figure 4. Panoramic Picture in the Main Hall Area of Building B.

Figure 5. Panoramic Picture in the Lecturer Room Area

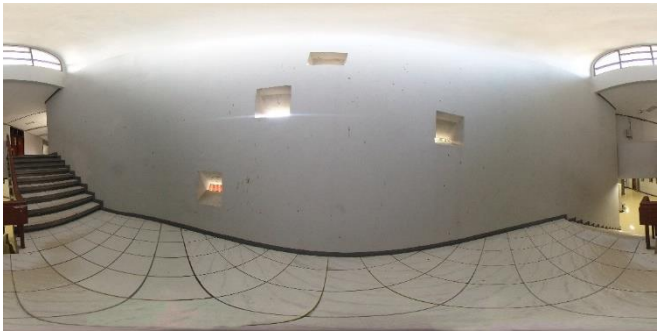

Figure 6. Panoramic Picture in Stairs Area.

Figure 7. Panoramic Picture on the 2nd Floor Balcony Area.

B. Data processing

The first step in processing Virtual Tour data. The first time is to open the 3Dvista Virtual Tour software. Then insert the panoramic images that have been obtained by shooting using a 360º camera into the application, using the "Panoramas" toolbar. So it will look like Figure 8 below.

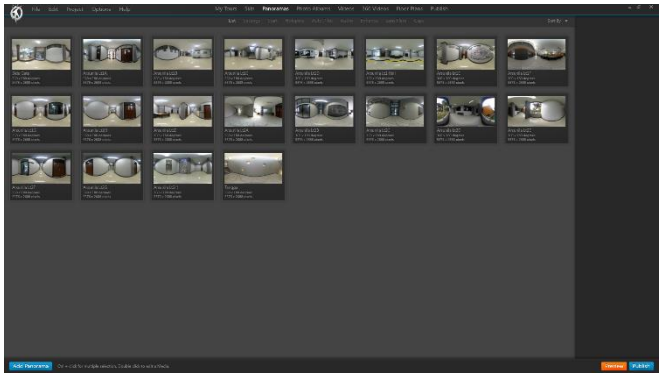

Figure 8. Panoramic Picture on the 2nd Floor Balcony Area.

After all the pictures have been entered into the application, the next step is to create a skin or interface design from the Project Virtual Tour. In this case, it is necessary to pay attention to what will be displayed on the Virtual Tour interface (see Figure 9). This relates to the ease of use of navigation buttons and other information. The skin/interface design on this Virtual Tour is divided into 2 major parts. The first part is the main viewer, which is the main screen that will display 360º images and the second part is the side screen which in this study the side viewer will be divided into 3 parts, information, floor plan, and navigation buttons. The navigation button area will contain the 1st Floor button, 2nd Floor button, Reset button, and the "Virtual Experience" button, which will lead to a survey form about user experience after doing the Virtual Tour.

Figure 9. Interface Design Process

After finishing designing the Interface, then proceed to importing the floorplan data (see Figure 10). This data displays a 1st or 2nd floor plan which will guide the user's position in the building according to the 360º image that the user sees in the Main Viewer.

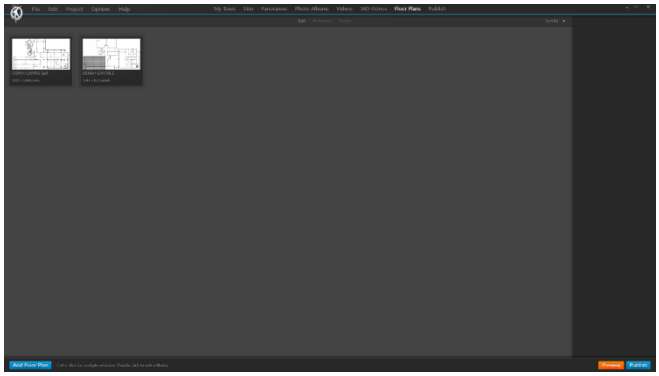

Figure 10. Floorplan Data Input Process

The next step is to enter the features & elements menu. This step is more about maximizing information about location and orientation when the user is in the building. Some of the features that need to be completed in this case are the user's location which in this software application is called a "hotspot", the direction of view or "radar" which will provide information on where the user's vision is with the user's standing point at the "hotspot" point. The direction of view or radar must be adjusted to the direction of the image presented in the "main viewer". For the hotspot image on the floor plan, using the Architecture logo, which shows Building B, Faculty of Engineering, which is the Building of the Department of Architecture, University of Lampung (see Figure 11).

Figure 11. The "Hotspot" point uses the Architecture logo

Then other elements need to be made such as the name of the room that will be placed on the wall or door of the room, along with information data that will appear when the door or room name is pressed (see Figure 12). The information that will be displayed in this case is a photo along with the name of the lecturer who owns the room. Some pictures of these elements can be seen in Figure below (see Figure 13).

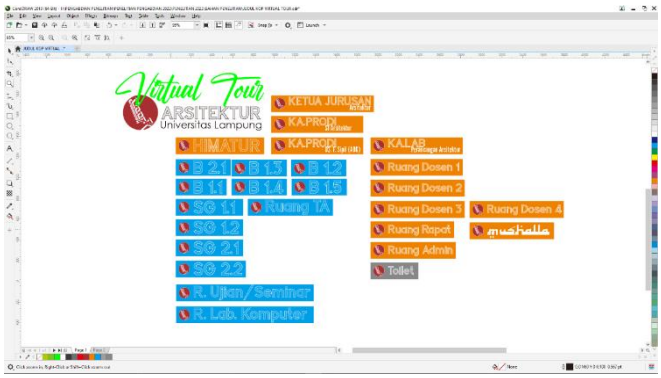

Figure 12. Space Name Elements and Other Information

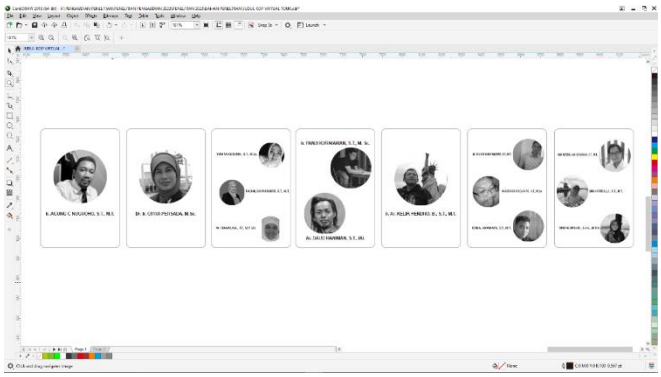

Figure 13. Lecturer Information Design based on the room they occupy, in the Virtual Tour

The design elements above use graphic design software which in this case uses CorelDraw which is then saved in an image format with the extension *.png Some of the elements that are visible inside the Virtual View (see Figure 14).

Figure 14. Elements in the Virtual View

C. Data Publication

After completing the features and elements, back sound and others that are deemed necessary, the next step is to publish the data. Starting with pressing the "publish" menu in the toolbar section of the 3Dvista Virtual Tour application, and selecting the export mode option (see Figure 15). The mode used inside. This publication is for web/mobile. After being exported in the form of web publication data, it is then entered into web hosting, which in this research data publication uses web hosting https://ars.unila.ac.id/.

The publication link as the final result of this research can be accessed via the link: https://ars.unila.ac.id/panjikurniawan/portofolio/gedungarsunila/index.htm.

Figure 15. Data Publish Export Mode

D. Testing

After it is completely placed in the public HTML folder, a test is then carried out by entering the following address in a web browser: https://ars.unila.ac.id/panjikurniawan/portofolio/gedungarsunila/index.htm. If it has been done correctly, the scene that we have created will appear. Access to this scene can be done anywhere, anytime, and using any device as long as it is still connected to the internet. The scene that has been successfully displayed will be able to look like the Figure 16 below.

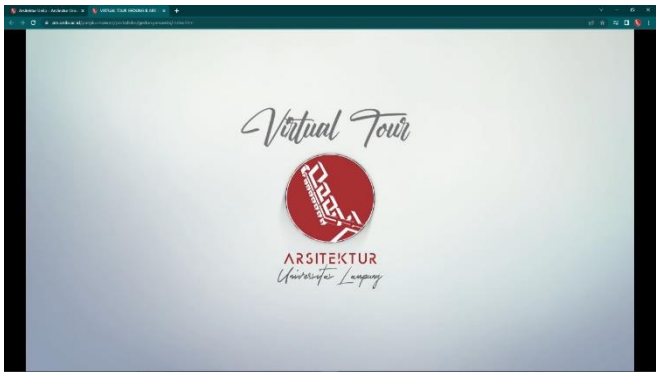

Figure 16. Welcome Menu of Building B Virtual Tour Publication

IV. CONCLUSIONS

In the R.I 4.0 Era and the current Post-Pandemic conditions, it is a very important moment for every individual to improve their experience of interacting with the virtual world. The availability of the internet and the ease of accessing data can be done by anyone, anywhere. This condition is an opportunity as well as a solution to be able to introduce the Architecture Building of the University of Lampung to the public, especially to parents and students who want to know more about the building. Know the location or plan of the building as well as see the interior space. This method needs to be continuously developed, especially in overcoming the limitations of post-pandemic conditions. Not only in knowing the location but can need to be developed in the form of a more dynamic interaction.

ACKNOWLEDGMENT

The author would like to thank all those who have helped in this research. To the Research Team, Studio Team "www.panjikurniawan.com design lab" and beloved family. As well as to the University of Lampung & the Faculty of Engineering. Hopefully this activity can be useful for all of us.

REFERENCES

[1] F. Fanani, "Data Terkini Jumlah Korban Virus Corona di Indonesia," Merdeka.com, 2020. Accessed on Tuesday, 20 October 2020. https://www.merdeka.com/jateng/update-data-terkini-jumlah-korban-virus-corona-di-indonesia.html.

[2] S. Maris, "Enam Kebijakan Kemendikbud dalam Masa Darurat Covid-19," www.liputan6.com, 2020. https://www.liputan6.com/news/read/4227701/enam-kebijakan-kemendikbud-dalam-masa-darurat-covid-19.

[3] C.F. Xiao, "A novel approach of consultation on 2019 novel Coronavirus (COVID-19)-related psychological and mental problems: structured letter therapy". Psychiatr. Investig., 17 (2020), pp. 175-176.

[4] Y. Anggara and GM. Zamroni, " Virtual Reality Tour Menggunakan Metode Gambar Panorama 360° Sebagai Media Informasi dan Pengenalan Gedung Perkuliahan Kampus 4 Universitas Ahmad Dahlan," *Jurnal Sarjana Teknik Informatika*, vol. 9, no. 1, p. 1-12, 2021.

[5] Kurniawan, Panji. (2019) "Simulasi Environment Setting dalam Penyajian Objek Arsitektur Dengan Lumion dalam Pengalaman Interaksi Komunikasi Berbasis 3d Visual Di Era Ri 4.0", Seminar Nasional Ilmu Teknik dan Aplikasi Industri, Prosiding, Vol 2, ISBN: 2655-2914

[6] Pei, Z. Application of CorelDRAW in Environmental Art Design. Journal of Landscape Research. search.ebscohost.com; 2015

[7] Gro¨ning, G.; Wolschke-Bulmahn, J.: The Native Plant Enthusiasm: Ecological Panacea or Xenophobia? Landscape Research, 28(1), 2003, 75-88. https://doi.org/10.1080/01426390306536.

[8] GuangSheng, M.; ShuHua, L.; YaZhou, Z.; Yue, H.: Planning of Plant Landscape Along Wulie River (Section from Anyuan Temple to Shuangfeng Temple) in Chengde, Guangdong Agricultural Sciences, 24(4), 2012, 46-54. https://doi.org/10.1177/0008125619897594.

[9] E. Adel, M. Elmogy, and H. Elbakry, "Image Stitching based on Feature Extraction Techniques: A Survey," Int. J. Comput. Appl., vol. 99, no. 6, pp. 1–8, 2014.

[10] C Meg. Nicola *Building Virtual Tour; Considering simulation in the equity of experience concept.* 2011.