



## Systematic Literature Review: Virtual Tour 360 Degree Panorama

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Submitted: 12-09-2022, revised: 20-09-2022, publication: 01-10-2022

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### Keywords

Virtual Reality;  
360- Degree  
Panoramic  
Virtual Tour;  
Systematic  
Literature  
Review

### Abstract

The application of VR as a medium to promote a place, be it tourist attractions, education, tourism or health, has become a common thing in the current era. 360-degree panoramic virtual tour itself is one method in making Virtual Reality. A 360-degree panoramic virtual tour is a collection of 360-degree images which are then processed so that they can be enjoyed virtually as if they were real. The goal to be achieved in this paper is to analyze a 360-degree panoramic virtual tour as a medium to promote a place, by conducting in-depth reviews and evaluating searches through selected literature based on certain criteria and the selected studies will be processed to answer research questions. Systematic Literature Review (SLR) is a research method that aims to identify and evaluate research results with the best technique based on specific procedures from comparison results. The results of the research on the selection of journal topics, Tourism, Education, and Health can be the main reference regarding the 360-degree panoramic virtual tour and there are various methods that can be used starting from MDLC, Luther Sutopo, Image Method, IMSDD, Qualitative.

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### 1. Introduction

Good technology is what can help and make a job easier. A form of technology utilization, one of which is in the field of multimedia which is currently widely used as a medium for conveying information, simulation media and also advertising. The multimedia technology that is developing today makes the delivery of information more interactive and effective because it can reach the human senses (Anggara & Zamroni, 2021). Virtual Tour is a technology that places the user in the image and allows the user to increase situational awareness as well as significantly increase the power of seeing, capturing, and analyzing virtual data (Baura et al., 2018). Panorama 360 is the result of processing digital photos in the form of panoramic photos. The panoramic photo is then processed to be used as software that can look up, and down, rotate or zoom. This photo uses advanced information technology so that it can make users see it as if they are where they are looking (Nulhakim & Hidayat, 2019).

In the application of virtual tours, there are several examples of media that are often used, namely: 360-degree video, and 360-degree *multi-image* panorama. In a 360-degree video, *the user* who uses it is just looking at and feeling the surroundings without being able to control what is displayed. While in the 360-degree *multi-image* panorama, *the user* gets full control in the digital simulation. In 360-degree *panoramic* operation. A virtual tour, it is divided into two ways, namely by accessing it through a website or with virtual *reality* tools (Nulhakim & Hidayat, 2019). Virtual tours themselves are usually used to give you the experience of 'having been' somewhere just by looking at the monitor screen. (Ngongoloy et al., 2018).

Virtual *reality* has been widely used in various fields according to its function, such as in making a virtual tour for promotional media where contains all information about the object or place that the user wants to visit. Some places that are suitable for using virtual tours are museums, tourism areas, schools, colleges, historical places, city parks, captive breeding areas, hotels, and others. In the field of virtual tourism, a virtual tour can help distribute a building or tourist attraction to the client by displaying the situation of a place to be marketed. Meanwhile, in the academic field, virtual tours can introduce plans from an educational institution to make it easier for visitors to find out the location of the buildings and buildings they will go to (Ramadan dkk, 2018)(Syani & Rahman, 2017)(Nulhakim & Hidayat, 2019)

Thus the goal to be achieved is the importance of the role of the 360 Degree Panorama Virtual Tour as a medium to promote a place. By conducting an in-depth review and evaluating the search through the selected literature, the selected subjects will be processed to answer research questions. So it is hoped that it can prove the influence of the 360 Degree Panorama Virtual Tour can be used as the most powerful medium and indicator to become a means of promoting a place. In this study, the paper search method was carried out using spontaneous techniques of certain *keywords* using *google scholar* which is still popular for the last 5 years. This research only limits it to papers from journals that will then be studied to produce the latest research related to the 360 Degree Panorama Virtual Tour.

## 2. Materials and Methods

### Systematic Literature Review

*Systematic Literature Review (SLR)* is a research method that aims to identify and evaluate research results with the best techniques based on specific procedures from the results of the comparison . In this study, the steps used followed the rules of the study as well as adopted the procedures of the research .(Ultimate & Rochimah, 2019)(Wahono, 2015). *Systematic Literature Review* is processed in three steps, namely: planning, implementing, and reporting literature reviews.

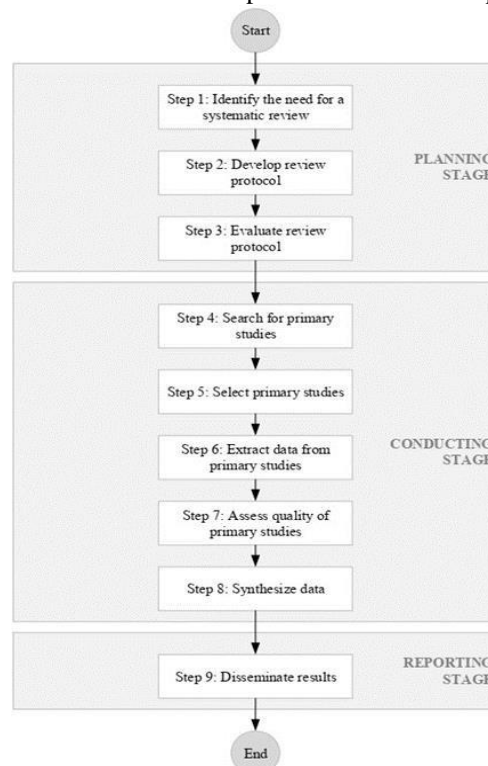


Figure 1. SLR steps(Kitchenham et al., 2009)

### Research Questions

The *Research Question (RQ)* is the first identification in the SLR method. RQ has the goal of conducting search

techniques and researching in-depth literature automatically by being oriented towards the object of the goal. To design a good RQ, PICOC shorting is used. (Kitchenham et al., 2009)

Table 1 presents a summary for the RQ of the PICOC. Table 2 presents research questions that aim to discuss further related to this study.

Table1. PICOC summary

<i>Population</i>	Virtual <i>reality</i> , Virtual Tour
<i>Intervention</i>	Virtual Tour Panorama
<i>Comparison</i>	-
<i>Outcomes</i>	Fields that include virtual tours specifically
<i>Context</i>	Special studies related to virtual tours

Table2. Research Questions and Objectives

ID	Research Questions	Purpose
RQ1	What research topics are widely used in 360-degree panoramic	Identify topics that publish a lot of 360-degree
	virtual tour research?	panoramic virtual tours
RQ2	What objects are widely used in virtual research of 360-degree panoramic tours?	Identifying objects widely used in a 360-degree panoramic virtual tour journal
RQ3	What methods are widely used in 360-degree panoramic virtual tour research?	Identifying methods that are widely used in a 360-degree panoramic virtual tour

### Search Strategy

Library review has certain parts of the search process, namely having to determine the *digital library*, choosing certain *keywords*, applying predetermined *keywords*, *correcting keywords* and collecting some literature from *the digital library*. Before starting the search, the initial stage that must be done is to determine or select the appropriate database to find the relevant paper. *The database of the digital library* used is GoogleScholar.

The choice of searching using certain *keywords* is carried out in several steps as follows:

1. Identify searches based on keywords by using PICOC summaries especially on *Population* and *Intervention*.
2. Identify searches using research questions.
3. Identify keyword searches using *abstracts* and aligned keywords and titles.
4. Identify word equations, opposites, and word switching based on search keywords.
5. Use keywords as an advanced search by applying Boolean AND and OR. (Wahono, 2015)

Keywords used for searching:

(Virtual Reality OR VR\*) AND (Virtual Tour Panorama OR Virtual Tour\*) AND (Virtual Panorama\*)

### Study Selection

Using inclusion criteria and exclusion criteria with the aim of obtaining *primary* literature which will then be reviewed. Table 3 presents a summary of the criteria to be studied.

**Table 3.** Criteria Summary

Inclusion Criteria	Studies included in Multimedia Preferred in Indonesian
Exclusion Criteria	Studies do not use validation Studies without the use of full text

Figure 2 shows the flowchart of search results and study selection after study.

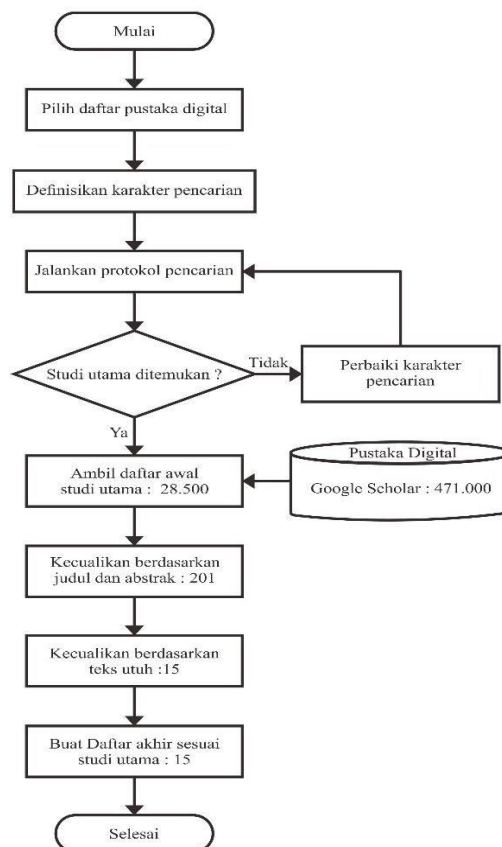


Figure 2. Results of Search and Study Selection

## 3. Results and Discussions

### Literature Evaluation

After the literature selection stage is carried out based on the journals that are most active in publishing papers related to the 360-degree virtual tour panorama with the best quality, the next stage is to evaluate the literature based on characteristics through methods and make comparisons of topics that most publish journals related to virtual tour panorama 360. At this stage, 10 final papers were obtained that met the requirements of the inclusion and exclusion criteria.

**Table 4.** List of Selected Literature Papers and Topic Comparisons

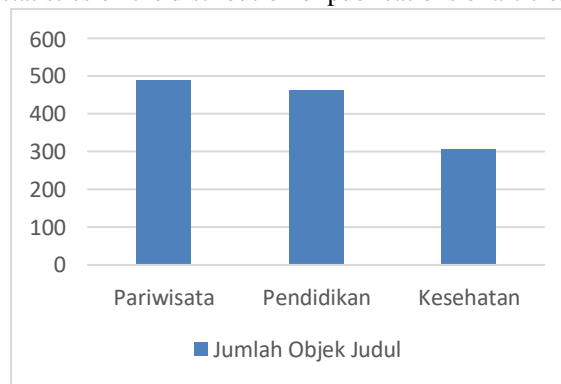
No	Reference	Heading	Topic	Method	Result
1	Badzlina K. Lasabuda, Dringhuzen J. Mamahit, Brave A. Sugiarto	Virtual Tour Introduction to Labuan Uki Bay in Bolaang Mongondow Regency	Tourism	MDLC	The following conclusions were obtained To take panoramic photos using the Canon M3 DLSR camera wide angle lens
	(2019) (Lasabuda and to the., 2019)				with ordinary photo techniques.
2	Ramadan et al (2018) (Ramadan dkk, 2018)	Virtual Tour Video 360 as a Promotional Media for Tourism Objects in Pangandaran Regency	Tourism	Luther Sutopo	Introduce objects tourism in Pangandaran Regency with Virtual Reality as a promotional medium.
3	Baura, Erin Ariandis Tulenan, Virginia Najoan, Xavier B N (2018) (Baura and to the., 2018)	Virtual Tour 360 Degree Panorama Of Tobelo City Tourist Attractions	Tourism	Luther Sutopo	The development of a Virtual Tour on HTML makes it easier for Users to get information on Tobelo City Tourist Attractions presented in the form of a 360 panorama
4	Says, Dio Safriadi, New Sukamto, Anggi Srimurdianti (2019) (Dio and to the., 2019)	Design and Build a Virtual Tour Application for Recreation and Family Entertainment Locations in Pontianak	Tourism	MDLC	The website-based virtual tour application was successfully built and can provide information to the public about recreational locations and family entertainment in Pontianak City.
5	Rani, S F Vanessa, V Rhapsodio, S Y	360° Virtual Tour Application as a Medium for	Tourism	Qualitative	This 360° Virtual Tour will make it easier travelers for

	(2021) (Rani and to the., 2021)	Introducing Cupunagara Coffee Educational Tourism Village, Subang			visit the educational tourism village of Kopi Cu- punagara, Subang so that tourists can still visit the village for tours even though virtually
6	Syani, Mamay Rahman, Fadli (2017) (Syani & Rahman, 2017)	Virtual Tour Interactive Panorama 360° Web-Based At Polytechnic TEDC Bandung Case Study Program Informatics Engineering	Education	MDLC	By implementing information in the form of 360° panoramic images, it makes it easier for users to receive and understand what they want to convey.
7	Anggara, Yogi Zamroni, Guntur Maulana (2021)	Virtual Reality Tour Using the 360° Panorama Image Method as a Medium of	Education	Image Method	A Virtual Reality Tour system has been developed using the 360° Panorama Image Method as a Medium for
	(Anggara & Zamroni, 2021)	Information and Introduction to the Lecture Building campus 4, Universitas Ahmad Dahlan			Information and Introduction to the UAD Campus 4 Lecture Building, which provides a real visualization of the UAD campus 4 lecture building so that it can help new students and the general public to get to know the UAD campus 4 lecture building better.
8	Nulhakim, Ridwan Hidayat, Eka Wahyu (2019) (Nulhakim - Hidayat, 2019)	Virtual Tour Introduction to Siliwangi University Area With Multi Image Panorama 360° Web-Based	Education	Luther Sutopo	Based on the research that has been done, it can be concluded that introducing Siliwangi University campus with digital simulation can be donewith Virtual Tour. Virtual
9	Adityo, The Great (2017) (Adityo, 2017)	Making a Virtual Reality Tour with Panoramic Image Method for the Campus of the Faculty of Engineering, Hasanuddin University	Education	Image Method	The virtual tour website uses 360 panoramic images as its main material taken through dozens of images to produce image quality in accordance with the standards of the photography industry.
10	Yurida, Harsi only	Virtual Tour Application in the	Health	IMSDD	The Virtual Tour application that was built

	Sukamto, Anggi Srimurdianti Muhardi, Hafiz (2018) (Yurida and to the., 2018)	Service Room of Rsud Dr. Soedarso Pontianak			has been successfully created and can provide information about the location of the room at the hospital. Dr. Soedarso through the available plans.
11	Manabung, Suzanna Edith Tulenan, Virginia Rindengan, Yaulie Deo Y. (2019) (Manabung and to the., 2019)	Virtual Tour Photo 360° Central General Hospital Prof. Dr. R. D. Kandou Manado	Health	IMSDD	Virtual Tour Application 360° Photo of RSUP Prof. Dr. R. D. Kandou Manado as an environmental recognition medium has been successfully created using the Interactive Multimedia System of Design and Development (IMSDD) method and can display 360° photos along with room information.

**Influential Title Object**

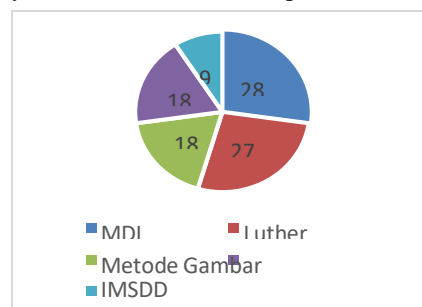
Based on the selected main journals, the most active title objects that publish papers related to the 360- degree virtual tour panorama are about Tourism as many as 488 articles, Education as many as 463 articles, Health as many as 307 articles. Figure 3.1 presents statistics on the distribution of publications of articles from selected literature



**Figure 3.** Distribution of Paper Title Objects from Selected Literature

**Comparison of Influential Methods**

Based on a comparison of selected literature, figure 3.2 shows that most of the methods on the 360- degree panoramic virtual tour are dominated by MDLC and Luther Sutopo followed by the Image Method and IMSDD, to the Qualitative Method.



**Figure 4.** Method Comparison



#### 4. Conclusion

After conducting research, it can be concluded that: a 360-degree panoramic virtual tour is still widely used in the 2017-2021 time span. Based on the selection of literature on journal topics, Tourism, Education, and Health can be the main reference related to a 360-degree virtual tour panorama, because the three journal topics are journals that can be used as promotional media for a place. Methods that are often used are MDLC, Luther Sutopo, Image Method, IMSDD, Qualitative. So that research and development of studies related to the 360-degree panorama virtual tour study is still very necessary in the future.

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