

Development of a Museum Virtual Tour Based on the Art Steps Application of the Lae Meang Old Tomb Site, Pakpak Bharat, Indonesia

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Abstract: The museum model in the modern era has experienced very rapid development. Initially, museums could not be separated from buildings and archaeological objects as collections. However, now the museum has been presented in a new form, namely the development of a virtual museum tour using various applications. In this research, the application used is the ArtSteps app. The objects or collections that will be displayed in this virtual museum are various types of archaeological remains found at the Old Lae Meang Grave Site, Mahala Village, Pakpak Bharat Regency, North Sumatra Province, Indonesia. At this site, 45 old graves were found which could be evidence of the entry and development of Islam in Pakpak Bharat Regency. This site also has high importance for history, science, education, religion, and culture. The benefit of this research is to understand historical heritage in Indonesia which is difficult to reach, so with the help of a virtual museum tour, you can save time, costs and present historical heritage with more realistic images.

Keywords: Virtual Tour, Museum, ArtSteps, Archaeology, Tombstone

1. INTRODUCTION

It cannot be denied that the impact of the Covid-19 pandemic is changing the way society interacts. At first, everything was meeting face to face, but suddenly it changed to using online media. The Covid-19 pandemic has also had a changing impact on the world of museums. During Covid, people's movement was limited so they couldn't visit the museum directly. Activities at the museum were suddenly paralyzed, due to the loss of visitors. To answer the challenges caused by the COVID-19 pandemic, museums have developed various strategies so that the museum world remains alive and can be enjoyed by the public. One of them is changing the exhibition directly in the museum room (offline) into an online exhibition [3]. This can be implemented using the Artsteps application.

Artsteps technology makes it easy for users to create three-dimensional virtual exhibition spaces for interior and exterior spaces and can use virtual reality (VR) to give a more real impression. Creating a virtual museum using a VR web such as the artsteps.com application is very suitable for designing virtual museum tours [1]. Pilliang (2004) states "The growth of information technology, especially the internet, has increased the need for real-time style or lifestyle, namely a pattern that requires everything to be done through virtual channels, which is done in aesthetics". In this way, information technology, especially the internet, has become mandatory in social life because it has become a lifestyle.

Currently, there are various kinds of websites on the internet, one of which is a gallery website. Technologically, according to Amri Yahya, a gallery is a place for displaying art objects or other cultural objects (including historical items) that are strictly selected and selected by a team or an expert who truly has quality. This is needed as a guarantee of quality [6]. Reflecting on this explanation, we can see the meaning of a gallery which is also a form of the character of a museum.

Museum collections that have been displayed conventionally in exhibition vitrines can be transformed into virtual exhibitions. Even archaeological objects on the site can also be collected in virtual museum exhibitions.

The Lae Meang Ancient Tomb Site is located very far inland, with this virtual museum service it is possible to exhibit it in virtual form too. Ancient tombstones with various distinctive and unique typologies are part of the collection in this virtual museum. The archaeological remains found at this site are tombstones with various typologies and ornamental varieties. This study is a preliminary review in identifying the existence of Hindu influences on tombstones at the Lae Meang Site. Through the stages of archaeological research by analyzing artifactual remains, this research revealed that elements of Hindu tradition are found in several typologies of phallus-shaped tombstones (phallus) and flattened at the Lae Meang Site. Although it dates back to the early 20th century, the typology of tombstones such as those at the Lae Meang Site has never been found before at other Islamic sites in Indonesia [4].

The archaeological remains of the Lae Meang Ancient Tomb Site can now be presented in a special room by following developments in information technology. Currently, there are many virtual galleries or gallery websites that present 3-dimensional exhibitions online or virtually, Artsteps.com is one of the gallery web pages that can present works of art virtually with high resolution, allowing visitors to feel like they are at a real exhibition even though they are Visitors only watch art exhibitions virtually via smartphone or laptop. The functions of the ArtSteps application include; (1) a Web gallery that presents virtual works of art in high resolution, (2) Helping creators create exhibitions, events, and promotions with a 3-dimensional realistic room concept, (3) Art room features for artists, (4) Helping in Open a web page to do work in the field of artwork.

2. METHOD

This research uses a research and development approach. The research and development of the ADDIE model has procedures structured with systematic sequences of activities at each development stage. In this research, there are five stages, namely (1) Analysis, (2) Design, (3) Development, (4) Implementation and ending with stage (5) Evaluation [5].

This research uses an archaeological approach to identify and map Islamic archaeological remains in Pakpak Bharat Regency, especially in Lae Meang Village. In this approach, the method used consists of four stages: 1) field observation or survey; 2) data identification; 3) data analysis; and 4) synthesis. When carrying out a survey, some archaeological data must be collected, including artifacts, ecofacts, features, and traces of ancient building structures which are thought to be evidence of traces of past human activity. The data expected to be obtained from this surface survey is in the form of a general description of the geomorphology of the area as well as various types of artifacts or ecofacts. Next, the data identification process is carried out to determine the morphological form of archaeological remains in the form of size, shape or typology, material, color, decorative patterns, and other data so that it can be analyzed to determine the relative period of use and use in the past.

3. RESEARCH RESULT

Procedures for Development of a Virtual Museum Tour

The development model used in compiling a virtual tour of the Lae Meang Old Tomb Site museum is the ADDIE development model. This model has five research stages, namely, Analysis, Design, Development, Implementation, and Evaluation [5].

3.1. Analysis

The analysis carried out at this stage was to analyze the needs of the community represented by 60 students from the Department of History Education, UNIMED, to measure the level of interest in developing a virtual museum tour model. Based on a questionnaire distributed to students taking Archeology courses, 60 respondents found that they wanted the development of a virtual museum to at least have innovative elements, provide a real experience, contain 3-dimensional elements, and be equipped with illustrations, 3D animation, and video. The following is a recapitulation of the results of the needs analysis regarding this matter.

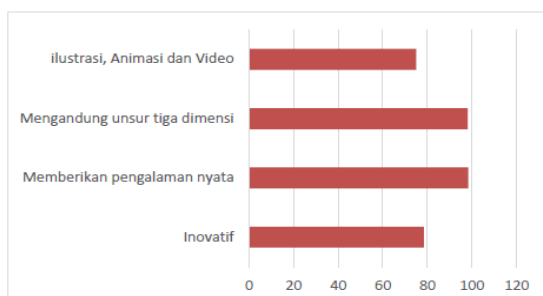


Figure 1. Percentage of Student Needs for Virtual Museum Tour Services

In this stage, data identification is carried out on objects that will become material in the virtual museum. The

data is in the form of tombstones at the Lae Meang Old Tomb Complex Site, Pakpak Bharat. In an archaeological study carried out in previous research in Lae Meang Hamlet, Mahala Village, an Islamic archaeological site was discovered, namely an ancient Islamic tomb complex. From this study, it was identified that there were at least 45 graves or around 90 tombstones. Interestingly, the tombstone typology at the Lae Meang Site is different from the tombstone typology at other Islamic sites [4]. Lae Meang is one of the names of the hamlets in Mahala Village, Tinada District, Pakpak Bharat Regency. Geographically, Lae Meang Hamlet is located at coordinates 2 o 15' 32" N and 98 o 31' 12" E. Lae Meang Hamlet has quite a distinctive geographical character because it is located on a hilly plateau with a height of 600 meters above sea level and is dominated by traditional forests from the traditional land of the Solin clan. For this reason, the customary forest is still very sustainable, and only 8% has begun to be used as community plantation land.



Figure 2. Lae Meang Old Tomb Complex Site

The geographical characteristics of being in the hills or highlands make it different from the tomb complexes in coastal areas or lowlands. Apart from that, the presence of the Pakpak ethnic group as an ethnic supporter of the tomb complex also contributes to giving color to the decorative patterns on the tombstones. Although from the analysis that has been carried out, it is known that the age of the Lae Meang Site is thought to be not too old, namely dating from the early 20th century AD.

In local tradition, it is stated that in the past the Lae Meang area was thought to be the location of traditional or lebbuh settlements by the Pakpak Bharat community, especially those from the Solin clan group. Lebbuh itself is led by a Pertaki, namely the eldest son of a clan. Therefore, in the Lae Meang area, two other tombs were also found at the foot of the hill which local people believe are the tombs of the Pertaki Lebbuh Solin clan. Apart from that, several umpak stones, or in the local language called cepu were also found in the Lae Meang area which functioned as foundation stones for a building. The cepu stone is thought to be a stone from the Sapo Jojong building of the Solin clan in that area in the past. So in terms of customary legitimacy in Pakpak Bharat, the Lae Meang area is considered a forest or traditional area of the Solin clan. In general, the current condition of the Lae Meang Site is in the middle of the Solin clan's traditional forest and is about 1 km from the nearest settlement [4].

3.2. Design

The next stage is entering the design stage which consists of several activities including developing initial ideas, carrying out data inventory in the field, namely the need to take photos of tombstones as a collection for the virtual museum to be designed, selecting content in the museum collection along with other historical data. The design stages in this research are as follows:

3.2.1. Create Flowcharts

The next stage is creating a program design in the form of a flowchart. This flowchart contains the development of concepts and data that will become content or collections in the virtual tour of the museum. Flowcharts consist of opening, content, and closing aspects.

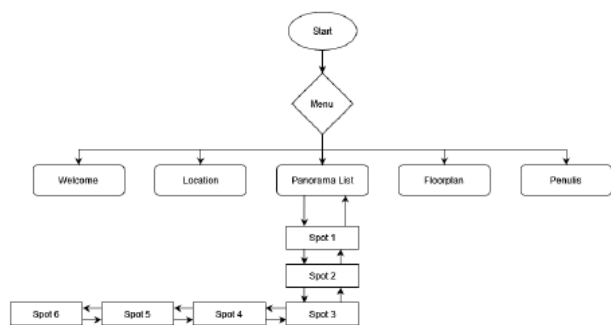


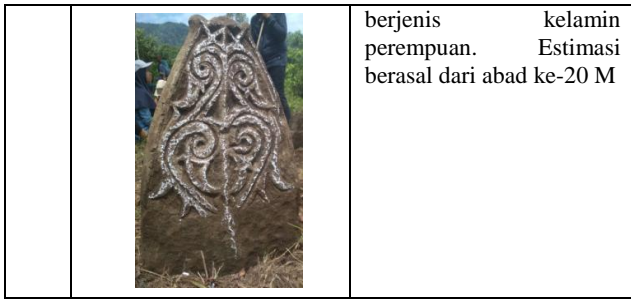
Figure 3. Virtual Museum Flowchart for the Lae Meang Old Tomb Complex Site

3.2.2. Create Storyboards

Storyboards are used to create a web display design for the photography gallery being developed. The storyboard contains the stages and materials that will be displayed on the virtual tour of the museum. The material that will become the museum collection comes from archaeological research that was carried out at the Lae Meang Tomb Complex Site in 2022. In the archaeological study that was carried out in previous research in Lae Meang Hamlet, Mahala Village, an Islamic archaeological site was discovered, namely a tomb complex. ancient Islam. From this study, it was identified that there were at least 45 graves or around 90 tombstones. Interestingly, the tombstone typology at the Lae Meang Site is different from the tombstone typology at other Islamic sites[4]. Based on the results of this research, the material in the virtual tour museum storyboard is as follows:

No	Tampilan Koleksi Museum Virtual	Narasi
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1		Tipe Batu Nisan Aceh Pada kompleks makam Lae Meang ditemukan 2 batu nisan dengan tipologi batu nisan aceh. Nisan ini memiliki hiasan yang sangat kaya, antara lain berupa hiasan geometris, floris (berbentuk bunga-bunga) dan motif khas Aceh. Tipologi batu nisan spiral diindikasikan berjenis kelamin laki-laki. Diduga berasal dari abad ke-19 M
2		Tipe Silindrik Lingga; Untuk wilayah Sumatera Utara, batu nisan dengan tipologi lingga baru hanya di temukan di Situs Lae Meang, Pakpak Bharat. Tipologi batu nisan spiral diindikasikan berjenis kelamin laki-laki. Terdapat inskripsi: “Ari Arba Bulan Maret Tahun 1928 nun Allah”
3		Tipe Pipih Antromorฟิก; Batu nisan dengan tipe pipih berundak seperti ini juga baru hanya di temukan di Situs Lae Meang, Pakpak Bharat. Menariknya motif hias pada nisan ini hampir seluruhnya dikenal dalam tradisi Papak, seperti gerga perkupkup manun, gerga perbunga rintua, gerga perbunga paku dan gerga perbunga kimbang. Tipologi batu nisan pipih diindikasikan berjenis kelamin perempuan. Terdapat inskripsi: “Simuna Marga Tumagir, Hari 18 Bulan Ramadan Tahun 1928, Kira Kira Umurnya 20 Tahun, Ini Perempuan Yang Mulia”
4.		Tipe Pipih Akolade; Batu nisan dengan tipe pipih akolade dengan motif hias seperti baru ditemukan di Situs Lae Meang, Pakpak Bharat. Tipologi batu nisan pipih diindikasikan



3.3. Development

The development stage is the stage of producing, purchasing or revising the materials needed to achieve development goals. In the development stage, there are several activities including the process of developing content (text, images, 3D objects, audio, and video) which is designed in the form of flowcharts and storyboards, collecting data from various sources, in the form of photos, videos and documentation regarding the Tua Lae Tomb Complex Site. Yes. Photos and images of the virtual museum collection were taken directly by the research team when they visited the Lae Meang Site on 15 – 18 May 2022. These photos were then developed into virtual museum products using the ArtSteps application.

In the process of developing a virtual museum tour using the Artsteps.com application, the steps that must be taken include:

3.3.1. Create an ArtSteps.com account and log in.

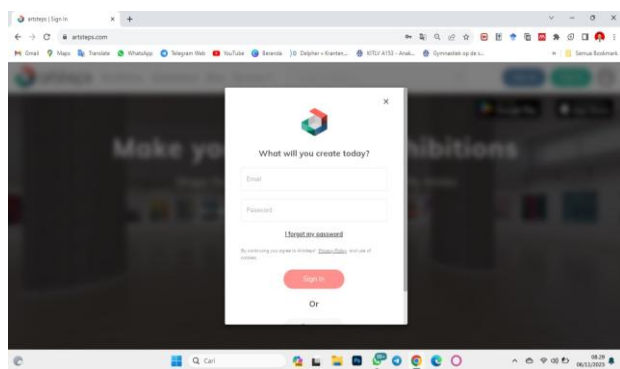


Figure 4. Stage 1

3.3.2. Create a room layout according to the theme

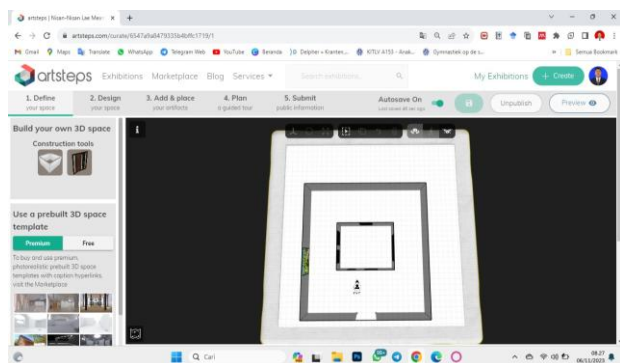


Figure 5. Stage 2

3.3.3. Upload photos and arrange photo layouts according to a predetermined theme

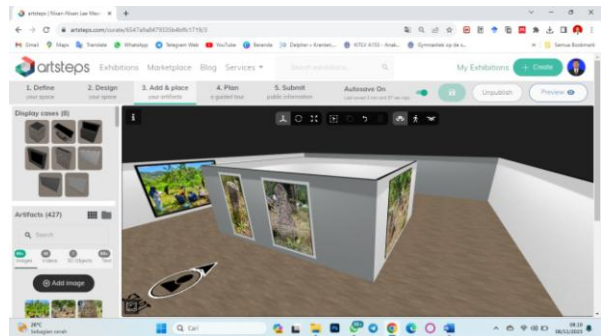


Figure 6. Stage 3

3.3.4. Provides supporting narrative to virtual museum collections

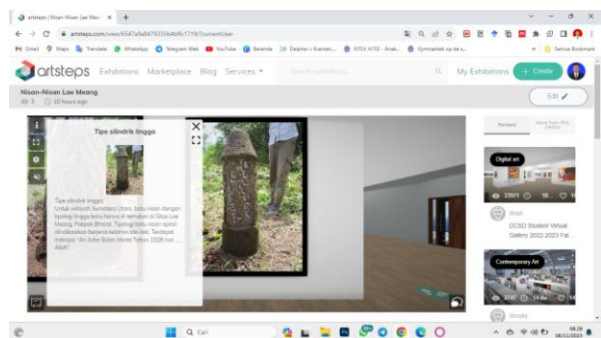
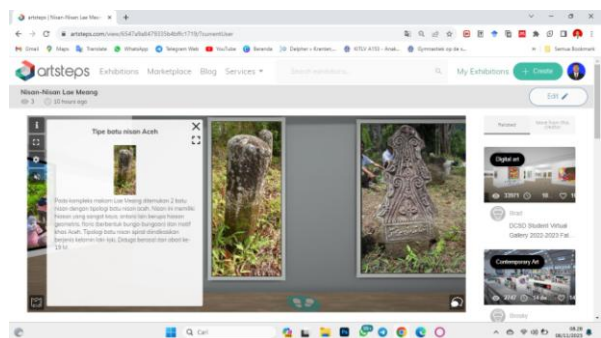


Figure 7. Stage 4

3.4. Implementation

After the analysis, design, and development stages have been completed, the next stage is the implementation stage. At this stage, a Virtual Tour of the museum was implemented using ArtSteps.com for students of the Department of History Education, UNIMED, via the Zoom application.

3.5. Evaluation

After carrying out the analysis, design, development, and implementation stages, the next stage is the evaluation stage. This stage consists of several steps, including language evaluation, material (content) evaluation, media evaluation, and field trials.

No	Aspek	Validator (Expert)	Skor	Kategori
1	Media	KW	91.81 %	Sangat Valid
2	Materi	HD	70.90 %	Valid
3	Bahasa	FAR	89.69 %	Sangat Valid
Rerata			84.14 %	Sangat Valid

(Sumber : Hasil Pengolahan Data Primer 2022)

. Figure 8. Evaluation Results of the Virtual Tour Museum of the Lae Meang Old Tomb Complex Site

4. CONCLUSION

The results of this research conclude that it is very important to develop virtual museum tours, especially in the field of in-situ archeology such as tomb complexes. The presence of a virtual museum tour of these archaeological sites helps people to visit an archaeological site without having to come directly to a location that is usually in a remote, remote, remote area and has difficult access, such as the Lae Meang Ancient Tomb Site in Pakpak Bharat. The Lae Meang Ancient Tomb Site can now be presented directly to people wherever they are simply by accessing the virtual tour of the museum which has been prepared via the ArtSteps application.

5. ACKNOWLEDGMENTS

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