Visualization Of The Traditional House Architecture Of Belek Sembalun Lawang Village By Using 3D Animation

Mahpuz¹, Hariman Bahtiar²
¹,²Universitas Hamzanwadi, Lombok, Indonesia
*email : mahfuzuma@gmail.com

Abstract. The development of information technology is currently progressing, multimedia is one of the right way to facilitate the delivery of information in the form of audiovisual form of 3D animation. Utilizing multimedia to convey information is as one way in an effort to publish the traditional architecture of the Lombok area, especially the traditional house of Belek Sembalun Lawang Village in the form of 3D animation using blender software that can be used as a medium of learning. Belek Village is a large village/village parent which was first created consisting of seven houses that are the forerunner of Sembalun Village. By using 3D animation is expected to provide solutions and alternatives in the process of introduction and learning about the traditional architecture of Lombok traditional house especially the traditional house of Belek Village, so that in the process of learning and recognition becomes more unique and interesting, as well as learning media and introduction of traditional house of Belek Village, 3D animation can also provide an advantage in publication efforts and documentation of history and culture of Sembalun Lawang Village.

Keyword : multimedia, animation, traditional house

1. Introduction
Indonesia is an island nation inhabited by various ethnic groups. Each region has a diverse culture including different languages, customs, and arts. One area that has a distinctive cultural identity is Lombok. Lombok has a variety of distinctive cultural arts such as dance, music, craft, and architecture. Lombok Island has a variety of traditional houses, one of which is Sembalun Lawang Sembalun District, East Lombok Regency. Sembalun Lawang has a traditional house called Belek Village traditional house which is located next to the Selong hill to the east of the foot of Mount Rinjani. Belek Village traditional house is a building made of wood on the pole, walls with woven bamboo, a foundation made of a mixture of clay and cow dung, roof with thatch that functions as a dwelling[1].

To introduce the architecture of the Sembalun village traditional house, it is necessary to have a learning and introduction media that is expected to be able to increase interest in the process of introduction and learning[2][3]. The process of recognition and learning can be improved by using computer technology in the form of 3D animation using audio-visual media to create unique, interesting, dynamic, and targeted learning[4].

Aside from being a media for introduction and learning, 3D animation can provide benefits in the effort of documenting and publishing the traditional house architecture of Belek Sembalun Lawang
Village, this requires 3D animation software such as Blender to help visualize learning material and knowledge in the form of animation[5][6].

2. Methods

2.1. Identification of problems
The problems that often arise caused by most people assume reading is a thing ordinary and boring, whereas in general the introduction of architecture Belek village traditional house using, books, pictures and articles to read so in the delivery of material readings are not absorbed optimally

2.2. Analysis of the current system walk
As for the procedure that runs deep architecture introduction and learning traditional house in Belek Sembalun Village This lawang is using media in the form of pictures, books, articles

2.3. Analysis of Results and Solutions
After understanding and recognizing then the problem can be proposed a solution for creating 3D animation which can be used as a medium introduction and learning about traditional architecture of Desa Belek agar material can be delivered in a manner optimal, unique and interesting. As for The procedure that we used can be found at describe as follows

3. Results and Discussion

3.1. Use Case Diagrams
The use case model explains about actors involved regarding the system created or developed together the process that is in it[7][8]. Use case diagram, from an introduction to architecture Belek Village traditional house is as follows:

![Use Case Animation Diagram](image)

Figure 1 : Use Case Animation Diagram

3.2. Flow of Animation Design
The flow of animation design is wrong one method used for illustrate the design of the animation 3D will be created, as for the design from this 3D animation includes opening, content and coverBefore starting to operate the school's geographical information system, there are several steps as follows:
3.3. Activity Diagram
Activity diagram is one way to describe events that are occur in use, as for the process 3D animation workmanship with blender is divided into three process namely, preproduction stage, stage production and post-production stages, The following activity diagram illustrates the process of making animation[9].

3.4. Pre Production
Pre production is the initial stage in making animation, this stage there are fundamental steps before carrying out the production process, to prepare for things that are in need before starting manufacturing animation. This process involves making ideas story, storyboard and character design.

1. The story idea is obtained by the writer from some related references with a similar theme, synopsis sequence which is in the introduction animation traditional architecture of a traditional house belek village begins with make a historical intro about Belek Village data house later followed by displaying character college student that explained in general about contents of 3D animation.

2. Storyboard
Storyboard is a visualization of ideas from the animation that was built so can give an overview of the animation to be generated. Storyboard is a sketch of a drawing arranged in accordance with the idea story made[10]. Storyboard function to facilitate flow creation, audio
direction, location, time and illustration the added data page, there is a form to add more school data under the auspices of the Nahdlatul Wathan organization.

3.5. Production
The production phase is a process continuation of all things that have been made during pre-production, in the production process this includes modeling, texturing, lighting, animating, camera, rendering[11][12].

![Figure 4: Modeling of Indigenous Houses, Exterior, Text, Belek Village.](image)

4. Conclusion
Based on the discussion that has been done can be drawn conclusions from animation about architecture introduction the traditional house of Belek Village Sembalun Lawang which can be used as a medium this learning is making. This animation refers to 3D animation (three dimensions) consist of stages: pre-production (preparation for animation 3D) production (start creating 3D animation) post-production (modify 3D animation) in the manufacturing process[13][14].

Based on the results of the study can be at draw conclusions namely with this 3D animation can be done provide solutions and alternatives in learning process and introduction traditional architecture of traditional village houses Belek in the learning process and the identifier becomes more unique and interesting, besides as a media home learning and introduction Belek Village custom, this 3D animation too can provide benefits in efforts to publicize customary village houses Belek, on the other hand besides as the media publication of this 3D animation can also be use as one of the media in documenting history and culture especially culture East Lombok in the form of 3D[15].

5. References
[1] K. Budaya and D. A. N. Tumbuhan, “SASAK TRADITIONAL VILLAGES: A POTENTIAL TOURISM AND PORTRAIT OF CONSERVATION EFFORTS FOR CULTURE AND PLANTS DESA TRADITIONAL SASAK: SEBUAH POTENSI PARIWISATA DAN POTRET UPAYA,” vol. 21, no. 2, pp. 203–220, 2019.
[2] G. K. Umar, D. A. Yusuf, A. Ahmed, and A. M. Usman, “The practice of Hausa traditional architecture: Towards conservation and restoration of spatial morphology and techniques,” Sci. African, vol. 5, p. e00142, 2019.
[3] X. Li, S. Han, M. Gül, and M. Al-hussein, “Automation in Construction Automated post-3D visualization ergonomic analysis system for rapid workplace design in modular construction,” Autom. Constr., vol. 98, no. November 2018, pp. 160–174, 2019.
[4] X. Gao, H. Cui, L. Zhu, T. Shi, and S. Shen, “Multi-source data-based 3D digital preservation of large-scale ancient chinese architecture: A case report,” Virtual Real. Intell. Hardw., vol. 1, no. 5, pp. 525–541, 2019.
[5] C. Wu and M. Chiang, “Computers & Education Effectiveness of applying 2D static depictions
and 3D animations to orthographic views learning in graphical course,” *Comput. Educ.*, vol. 63, pp. 28–42, 2013.

[6] J. H. Iwasa, “ScienceDirect Bringing macromolecular machinery to life using 3D animation,” *Curr. Opin. Struct. Biol.*, vol. 31, pp. 84–88, 2015.

[7] P. K. Arora and R. Bhatia, “Agent-Based Regression Test Case Generation using Class Diagram, Use cases and Activity Diagram,” *Procedia Comput. Sci.*, vol. 125, pp. 747–753, 2018.

[8] R. K. Swain, V. Panthi, and P. K. Behera, “Test Case Design Using Slicing of UML Interaction Diagram,” *Procedia Technol.*, vol. 6, pp. 136–144, 2012.

[9] Meiliana, I. Septian, R. S. Alianto, Daniel, and F. L. Gaol, “Automated Test Case Generation from UML Activity Diagram and Sequence Diagram using Depth First Search Algorithm,” *Procedia Comput. Sci.*, vol. 116, pp. 629–637, 2017.

[10] P. Kidambi and S. Narayanan, *Personalized interactive storyboarding utilizing content based multimedia retrieval*, vol. 12, no. PART 1. IFAC, 2013.

[11] M. Sorapure, “Text, Image, Data, Interaction: Understanding Information Visualization,” *Comput. Compos.*, vol. 54, p. 102519, 2019.

[12] A. Elnimr, M. Fagiar, and Y. Mohamed, “Automation in Construction Two-way integration of 3D visualization and discrete event simulation for modeling mobile crane movement under dynamically changing site layout,” *Autom. Constr.*, vol. 68, pp. 235–248, 2016.

[13] W. Zhi-qiang, “Virtual Package Design and Realization Based on 3D Visualization Technology,” *Procedia Eng.*, vol. 174, pp. 1336–1339, 2017.

[14] A. Lovett, K. Appleton, B. Warren-kretzschmar, and C. Von Haaren, “Landscape and Urban Planning Using 3D visualization methods in landscape planning: An evaluation of options and practical issues,” *Landscape and Urban Plan.*, vol. 142, pp. 85–94, 2015.

[15] K. Keskin and M. Erbay, “A Study on the Sustainable Architectural Characteristics of Traditional Anatolian Houses and Current Building Design Precepts,” *Procedia - Soc. Behav. Sci.*, vol. 216, no. October 2015, pp. 810–817, 2016.