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3D Animation: Cultivation and Processing of Aren Juice Content in North Sulawesi

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A B S T R A C T

Aren trees are able to produce raw materials for the craft industry. Almost all parts of the date palm can be used or have a sale value. Aren cultivation is still rarely done due to a lack of attention to the development of Aren plants by various parties. This study aims to make an animated film introducing Aren cultivation which can introduce the process of Aren cultivation. Animations are made in Blender 3D, which is software for creating 3D objects and animations. The method of making animation consist of making storyboards, modelling and texturing, rigging, forming sets, animation and rendering, as well as editing and final rendering. The resulting 3d animation of cultivating Aren is loaded sequentially in the animation starting from geo-content of aren areas, cultivation and processing of the Aren juice until it is ready to be packaged

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INTRODUCTION

Aren or Enau (Arenga pinnata (Wurmb.) Merr.) known as palm sugar, is a plant that produces industrial products that are well known to us. Most of the components or by-products of this plant are useful and have monetary value. For example, aren palm has the potential to be utilized as a raw material for bioethanol, which can then be processed into an environmentally friendly biofuel, in addition to being a raw material for industries that produce alcohol and palm sugar. Through customary utilization, communities both inside and outside the forest can directly feel the impact of aren palm. The trees that are utilized are generally still plants that grow and develop organically in nature, but unfortunately these plants have not received much attention to be developed. The population of these plants has been declining rapidly due to insufficient agricultural activities as a result of forest degradation and conversion of forest land to other uses. In addition, there has been no inventory, so it is not known how many of this tree species there are.

Since most farmers only use naturally grown plants, even though aren palm has potential, its cultivation needs to be done differently. Since aren palm is widely used as a source of carbohydrates, sugar, ethanol, and biofuel, there is a concern that there will be a scarcity of plants because the harvesting period is so long-approximately 7 to 12 years-and the plants are quite long. -Life. Because it is widely utilized without being balanced with replanting and because aren palm seeds require a long hibernation period of about three months to germinate, the population of aren palm plants is decreasing and becoming scarce (1). Because aren palm plants have a stiff and thick seed coat, aren palm seeds naturally have a dormancy period that ranges from 1 to 12 months. It is this dormancy that causes the palm trees to produce palm seeds. As a result, the seeds are spared from dormancy, which makes them less viable by preventing water and gas from entering the seed. aren palm seeds naturally have a dormancy period that varies between 1 to 12 months, the dormancy that occurs in aren palm plants is caused by the physical state of the seed coat because aren palm plants have a hard and thick seed coat. This causes obstruction water and gas that will enter the seeds, dormancy in seeds causes them to lose their viability (2).

One of the key criteria for successful planting for best results, apart from breaking dormancy, is seed quality. Plant development in the field is influenced by seed size. In general, plants grown from large seeds tend to be stronger than those from small seeds (3). The seeds contain minerals, proteins, lipids, carbohydrates, and proteins. These substances are needed for the embryo germination process as energy and raw materials. To obtain an effective dormancy-breaking technology, efforts to produce good and uniform palm seeds must still be made. Once this technology is applied, farmers will be able to obtain aren seeds faster and the supply of these seeds will not be a problem in the future come.

Compared to other forms of media such as motion graphics and graphic design, animation has much greater storytelling potential. It is no wonder that many movies today are animated. The moving image known as animation consists of a collection of objects arranged in a certain order and moves according

to a predetermined path each time an interval occurs. The images or objects in question can be pictures of people, animals, or even writing.

Plants that belong to the same genus of palm trees, arenas or areca palms, include palm trees, coconuts, and nipahs. All components of palm plants are useful, as is the case with coconut trees. The sap of the palm tree or aren palm is one of the well-known benefits because it can be used to make palm sugar. In addition, other components, such as leaves, can be used to make palm fiber brooms and roofs for conventional houses.

The aren palm tree is known by many different names in Indonesia, including kawung in Sumatra, the Malay Peninsula and Sunda. Akol, akel, akere, inru, and indu in Taren Sulawesi. Moka, moke, tuwa, and tuwak in Nusa Tenggara. Previously, the palm tree was referred to as aren or zuikerpalm during the Dutch colonial period. While this plant is referred to as zuckerpale in German, aren or gomuti palm in English. The benefits of this research are intended so that the community can increase the desire to cultivate palm trees by planting palm trees, providing superior quality seeds, crop yields, developing palm tissue culture (Arenga pinnata), and can also be able to increase community knowledge in preserving palm plants.

LITERATURE REVIEW

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Multimedia Multimedia is the use of computers to present text, sound, images, animation, and video, combined with tools and connections that allow users to navigate, interact, create, and communicate. Multimedia is commonly used in the entertainment world. Multimedia has been adopted not only in the entertainment world, but also in the gaming world. Multimedia can also be interpreted as the use of several different media to convey information in the form of text, audio, graphics, animation, and video. According to Binanto (2010), there are three types of multimedia: interactive, hyperactive and linear multimedia. The use of multimedia makes the presentation of information more interesting and more accessible to users.

Animation is a motion simulation created by displaying a series of frames into layers. A frame is one of the units of images in a series of animated images. Not just for movement, animation also includes everything that has visual effects such as changes in animation position, shape, color, structure, object texture, and camera position over time, lighting, orientation, focus, and changes in rendering techniques. The use of animation includes making movies, commercials, video clips, games, and shows. Several terms are known in the world of animation to distinguish between the technical types of animation, including: Two-dimensional animation, or more popularly known as cartoon, is a type of animation created using hand-drawn animation techniques or digital cell animation.

Two-dimensional animation can be made in 2 ways, namely manual and computer. Animation techniques using manual animation techniques or cel animation are the oldest animation techniques. With this animation technique, animators can create images on multiple layers of celluloid sheets (transparent sheets). However, with today's advances in technology, animators use plain paper, which is then scanned and colored by a computer.

3D (three-dimensional) animation. The three dimensions referred to here refer to the measures of length, width, and height. 3D objects can move places in 3 dimensional axes, namely up-down, left-right, and front-back. 3D objects are also called space builds. The main characteristic of 3D is that it can be filled with certain objects, or have volume. Examples of 3D objects include blocks, cubes, tubes, cones, houses, cars, animals, and people. This type is called three-dimensional (3D) because of the depth or spatial nature of the object. At first glance, this type of 3D animated film is easy to recognize. With its smooth shape, more realistic lighting, and a more striking sense of space. All this is possible because it is supported by today's sophisticated computer technology. This type of animation allows you to view animated objects from any angle or side. It looks like a real doll, but the object is created digitally using special software.

METHODOLOGY

The stages in the research method in this study are: Pre-Production Stage, Production Stage and Post-Production Stage.

A. Pre-Production Stage

The pre-production stage is the initial stage in the process of making an animated film. At this stage the author makes a Storyboard.

a. Storyboard

Storyboard is a sequence of images that represent the shooting for movie production. The animated storyboard of the introduction to palm cultivation is contained in table 1 as follows:

Table 1. Storyboard of the Introduction to Palm Cultivation is Contained in Table

Figure	Description
	The selected palm fruits are peeled and separated from the seeds. the peeled seeds will be soaked in warm water.
	The seeds are dried in the sun for 3 days, the dried seeds will turn black in color. After the seeds become black in color, the seeds will carry out the seeding process.
	After 2 weeks, the seedlings will germinate and then transfer the seedlings to polybags filled with soil.
	When the seedlings have grown into buds, the palm can be planted into the ground.

	The buds will grow into Aren trees ready for harvesting.
	Trees that are ready to be harvested will be processed by farmers

B. Production Stage

The Production Stage is a stage where the process of making 3d modeling of an approved character and props begins. There are several stages in production, namely:

a. Modeling

Modeling is the process of creating three-dimensional objects. In this process, the author creates objects that will be included in the video. Here are all the objects made by the author in Figure 1 below:

Figure 1. All the 3D Objects

The human 3D model assets were imported into Blender. This asset was not created by the author, but is an asset available on the Turbosquid website.

Figure 2. The Human 3d Model

b. Rigging

Rigging is the process of creating a bone structure on an object. In making this animation, the object that is rigged is a farmer object.

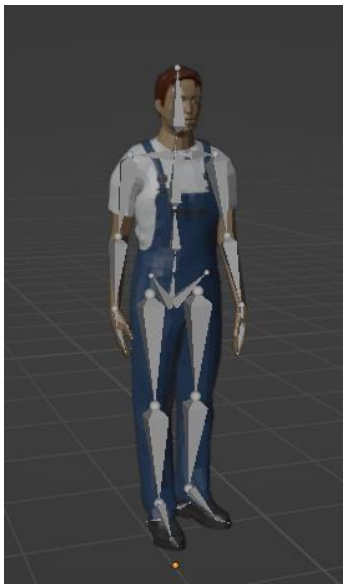

Figure 3. The Human Rigging

c. Animating

The animating process is the process of creating movement on objects. After the required objects were complete and the human object was rigged, the animation process in Blender software began. In this process, the author creates a keyframe which is the starting point or end point of the transition. In Figure 4, the timeline of the first scene shows keyframes for the farmer object and the knife object.

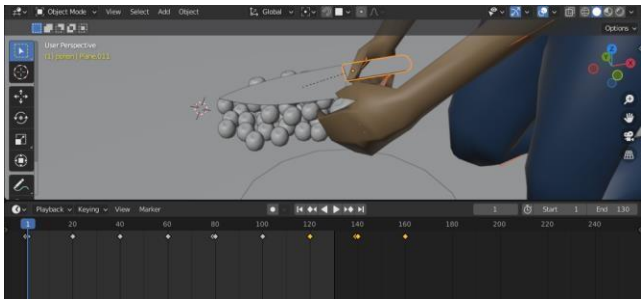

Figure 4. Timeline

C. Post-Production Stage

a. Video Editing

Combining scenes from the animation created and put together into one video form. To add a real impression in the video, sound effects or supporting sounds are added to follow the scene that is being displayed on the screen.

RESULTS

The animation of the introduction to palm cultivation is about 6 seconds long and consists of 6 scenes. In this journal, the author displays screenshots of each scene.

1. First Scene

The first scene is 7 seconds long. This scene shows the farmer peeling the palm fruit and showing the seeds that have been separated from the fruit soaked in warm water. The shot is taken from left to right slowly. This scene starts from second 15 to second 22.

Figure 5. First Scene

2. Second Scene

The second scene is 8 seconds long and shows the seeds drying for 3 days and then the seeding process where the seeds are put into sacks and covered with sawdust. This scene starts from second 24 to second 32.

Figure 6. Second Scene

3. Third Scene

This 5-second scene shows the seedlings germinating and the seedlings being transferred to polybags filled with soil. This scene starts from second 33 to second 38.

Figure 7. Third Scene

4. Scene Four

The fourth scene is 5 seconds long and shows the seedlings growing into shoots and being planted into the ground. This scene starts from second 39 to second 44.

Figure 8. Forth Scene

5. Fifth Scene

The fifth scene is 14 seconds long and shows a bud growing into a palm tree that is ready to be harvested. This scene starts from second 46 to second 60.

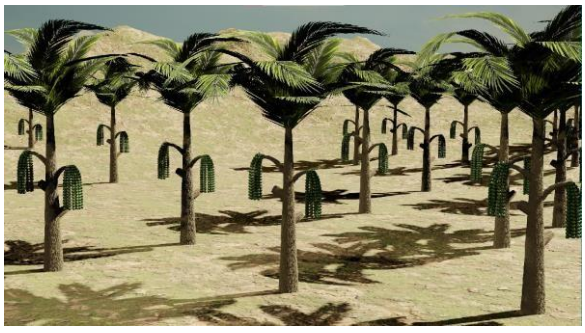

Figure 9. Fifth Scene

6. Scene Six

The last scene is 10 seconds long and features farmers harvesting sugar palm trees. There are two farmers in this scene where one farmer is cutting the trunk of the palm fruit and the other farmer is taking water from the tree and putting it into a jerry can. This scene starts from second 62 to second 73.

DISCUSSION

It can be concluded that the animation of the introduction to palm cultivation was made using blender which has several stages such as modeling, texturing, rigging, and animation. The methods used in this journal are the pre-production stage, production stage, and pre-production stage. In making the animation of palm cultivation, there are 6 scenes, namely.

CONCLUSIONS AND RECOMMENDATIONS

The first scene shows the farmer peeling the palm fruit and displays the seeds that have been separated from the fruit soaked in warm water, the second scene displays the seeds in the sun for 3 days then the seeding process is carried out where the seeds are put into sacks and cover them with sawdust, the third scene displays the seeds have germinated and the seeds are transferred to polybags containing soil, the fourth scene displays the seeds have grown into shoots and planted into the ground, the fifth scene displays the shoots growing into palm trees that are ready to be harvested, and the last scene displays the farmer harvesting the palm tree.

FURTHER STUDY

Further investigations. To find out how and the process of making sap water that will be distilled into alcohol, a storyboard and animation are made.

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