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Environmental Visual Concept of Hybrid Animated Film 'Si Dulang' For Fine Dining Projection Mapping

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ABSTRACT

Technology and animation are the combinations that complete each other. It would be interesting to see how culinary cuisine comes into play in between. The research journey on how to enhance the immersive experience in fine dining with a projection mapping on a table by using a video projector to map hybrid animation has broadened the cutting-edge digital art and industrial area. In creating an immersive environment that complements Indonesian food and is tailored to the themes, ideas, and concepts, this research objective is focused on the environmental visualization concept of an animated film called 'Si Dulang', which is heavily impacted by Bali cultural aspects and based on famous attractions in Bali. Literature studies and observations of various projection mappings will be used as a research method to achieve a prototype of the animated film and environmental visual concept. The result is following the concept designed from the beginning although there are improvements in the composition arrangement. Therefore, it takes several tries to find the appropriate size of the object projected from the projector.

Keywords: environment visualization; projection mapping, hybrid animation

INTRODUCTION

"Si Dulang" tells the story of a boy from the capital city of Indonesia, Jakarta, who goes on an adventure to learn about one of Indonesia's regional specialties, Bali. During his journey, "Si Dulang" meets people who live on the mountain as well as antagonists who often disturb residents and prevent "Si Dulang" from exploring Balinese specialties. To gain knowledge about Balinese food, "Si Dulang" visits several places that must be passed, one of which is a residential area close to the forest and also the beach. Indonesia is the largest archipelagic country with abundant natural resources.

One of the popular places for foreign tourists in Indonesia is Bali. Bali has mountains, beaches, hills, and a pleasant climate (Riyanto & Afifatun, 2023, p.V). The natural beauty of Bali, especially the forests and beaches, will be a reference for the visual concept of the environment in the story of "Si Dulang". Besides that, Bali also has culinary diversity that has been recognized worldwide. Kruger voted Balinese cuisine as topnotch amongst the Indonesian various cuisines due to the varieties of Balinese dishes are endless making it a unique yet delicious combination (Radzi., et al, 2016, p.300).

Therefore, many eateries offer Balinese food concepts in Bali and areas outside of Bali for people to experience Balinese food. Each restaurant has its concept of offering a lunch, breakfast, and dining experience, one of which is fine dining. Lukmanto (2022, p.2), fine dining provides special services so that customers have satisfaction with the taste of food and the way it is served. Hence, before choosing a fine dining venue, customers will usually pay attention to the promotion, price, quality, setting, diet, and characteristics of the menu offered. Firman *et al* (2023) added that the difference in cooking and how meals are served could give a new experience and a sense of satisfaction to the customer itself (p.603). Customer expectations of fine dining of immersive dining experiences. The culinary experience has been influenced by digital media technology, such as restaurants that provide audio-visual experiences in their diner/customer rooms as well as tell

stories about ingredients through customer's mobile phones at the dining table (Fukuda, 2023).

Based on what has been exemplified in the previous paragraphs, immersive experience dining can also be done with project mapping, because Fukuda (2023) adds that every type of new media arts technology displayed on the table to create a multi-sensory atmosphere. Projection Mapping is a technique for projecting video onto diverse surfaces, which can be used at events such as concerts, fashion shows, music festivals, and other performing arts. Video mapping integrates audio-visual elements to create the illusion of a physical image. This can be done live with pre-recorded real-time video. To accomplish this, an editing program is essential to create motion graphics and images as a medium to display them to the audience. Once the images are created, they are projected onto a three-dimensional object, such as a historical building, and adjusted to fit the shape of the target object (Ekim, 2011, p.11). According to Yoo and Kim, project mapping is one technique that can help the creator interact with the audience during the performance, in which the audience engages with the technology and may then share their experiences following the performance (2014, p.76).

The media combines audio and visuals with stories such as animated films or cartoon steps (Riza, Kustion, & Ahmadi, 2021). Also, the shape of the target object to display video mapping can be applied to the dining table, such as table projection mapping (Armielia, Prawira, & Pradiati, 2023, p. 4-5), table projection mapping is a method employed to create an immersive dining experience, a practice adopted by restaurants and hotels in various countries. Using a projector mounted above the dining table, animated videos related to the theme, ideas, and concepts are projected onto white plates and tablecloths. Typically, these animations are shown between courses, providing information about the dish or purely for entertainment, and sometimes both.

An illustrious instance of projection-mapped dining experiences is Le Petit Chef by Skull Mapping, which has established itself globally with numerous locations.

“Si Dulang” is a hybrid animation project that will be used for projection mapping of the dining table as one of the immersive dining experiences. “Si Dulang” is themed around one of the best culinary, places, and history in Indonesia, Bali. The project was designed by three lecturers from Universitas Multimedia Nusantara, Adestya Ayu Armeilia from the hospitality department, and Yohanes Merci Widiastomo and Christine Mersiana Lukmanto from the animation department along with several students involved. The first and second authors were not involved at all in the creation of this project except the third author. It is hybrid animation, which combines two-dimensional (2D) and three-dimensional (3D) techniques that are used by many animators or designers to create cartoons, short stories, and other forms of animation. The process of creating 2D and 3D models often involves several processes that are commonly utilized within animation production such as the development of characters and environments. (Asraf., et al., 2020, p.1., 3.).

In the production of “Si Dulang” hybrid animation, the concept artist will go through a research stage to design visuals that will appear in certain scenes. This crucial step is commonly referred to as concept art. During this step, the concept artist or illustrator will turn an idea or initial sketch into a visual work that will support the character and environment of a film, animation, or other visual work. (Lukmanto, 2022, p.3).

Concept artists are not only responsible for the creation of characters but also for the creation of other elements such as the environment. Consider the correlation between the environment to be featured in a scene that synchronizes and vice versa.

(Islam & Shamsuddin, 2013, p.819). Creating an environment is not only focused on the background of some stories, but it can also assist the viewer in understanding more about the characters themselves, such as their surroundings and how they interact with them (Ramadhani, Soewito, Nugroho, 2023).

The previous research discussed the Visual Concept for Characters in the Fine Dining Projection Mapping project entitled "Si Dulang". As a continuation, this research focuses on how the visual environment concept is created and visualized, where the charming essence of Bali such as culture and historical places becomes a reference to form the background story and environment concept of "Si Dulang" as shown in Figure 1.



Figure 1. Artbook of "Si Dulang" environment reference
source: author's documentation

This research specifically focuses on two environments, a forest for act 1 and a beach for act 2. The purpose of this research is how the Balinese environment and culture are displayed and represented in the animation work of "Si Dulang" to support the story and characters according to the scene. And the correlation between the environment and characters will be seen when guests see the "Si Dulang" animation mapping project before the food is the characters and the required setting, served.

RESEARCH METHOD

This paper uses a five-stage design thinking process: 1) empathies; what the user needs 2) define; gather the information 3) ideate; create some ideas for user needs 4) prototype; results from the ideas before 5) test; result and improvement after prototype (Gwangwava, 2021).

Empathies stage is where the data are collected based on literature sources and observations from Bali culture, history, and environment. In the define stage, the author and visual concept artist gather and analyze the findings from the

empathize stage, subsequently aligning them with the environment visual concept of the "Si Dulang" film. In the ideate stage, the concept artist and illustrator try to combine all the data and the result of observation from the define stage to see how the Balinese setting is displayed and realized into animation in the fine dining "Si Dulang" project.

Prototype; after the environmental concept is finished, the illustrator and 3D modeling will create the visualization from the concept artist. The prototype is done by projecting the video mapping above the table in the UMN Studio. However, this prototype is only for user testing, the author tries to ensure that the "Si Dulang" film mapping project can demonstrated above the table seamlessly for a table of four people.

RESULT AND DISCUSSION

"Si Dulang" is a collaboration project between UMN Hospitality and Film. The collaboration presented is to create an immersive fine dining experience with the concept that serves Balinese cuisine. To get the immersive experience, a projection mapping will be displayed on the guest table and when the story is finished, guests can enjoy the food served. The primary objective of this research is to investigate how the visual concept of the environment can synergize with the characters and narrative of "Si Dulang", which will be projected onto the dining table through mapping technology. "Si Dulang's" animation work comprises four distinct acts, as illustrated in Figure 2, each contributing to the overarching environment of the "Si Dulang" narrative world. Each act unfolds in a unique location, featuring diverse characters alongside the central figures of "Si Dulang" and Barong. However, this research only discusses two of the four acts, namely Act 1 and Act 2. In the initial sketch, the location of Act 1 is at the top of a hill and has a different feel from Act 2. Where Act 1 is in the forest, on a hill while Act 2 is on the beach near a residential area.

ACT 1	ACT 2
The setting occurs inside the forest, located at the top of a hill. In this Act, Si Dulang meets Barong for the first time.	In Act 2, Barong meets his rival, Rangda. The battle occurs on the beach near a residential area.

Table 1. Environment Design Concept for Each Act
 source: author's documentation



Figure 2. Artbook of "Si Dulang" environment map
 source: author's documentation

The "Si Dulang" 'world' map has been tailored to reflect the unique geographical characteristics of Bali. Bali can be broadly divided into two distinct regions, the highlands, and the lowlands. This geographical contrast arises from the island's distinctive topography, featuring two active volcanoes, Mount Agung and Mount Batur. Within Bali's architectural tradition, there exists a fundamental concept known as Tri Angga, which serves to partition the island into three distinct levels: the high, the middle, and the low. Achmad and Antariksa added The Tri Angga idea is based on the human body, which is comprised of three parts: the head, body, and feet (2019).

In this context, the highest areas, characterized by their mountainous terrain, are regarded as sacred and hold profound significance. The middle regions are predominantly residential areas situated in proximity to the coastal zones, while the lowlands encompass the coastal areas themselves such as beaches. Tri Angga's

classification reflects the thoughtful consideration of human needs for survival and harmonious coexistence with Bali's diverse landscape. (Hakim, Kim, and Hong, 2009). Before creating animated mountainous terrain as the highest area, visual concept artists collect the real picture of mountains around Bali as shown in Figure 3.



Figure 3. Artbook of “Si Dulang”
source: author’s documentation

The essential colors such as green and chocolate and natural elements like trees, mountains, plants, grass, and land from real-life scenery from mountains in Bali are applied to the “Si Dulang” Act 1 environment in Figure 4. There would be a big plate, the plate is deliberately made in the center to show how “Si Dulang” cooks the ingredients and displays the finished food visually before putting the real plate and food on the real dining table. In Act 1 environment is the mountain area which is a sacred area where “Si Dulang” meets Barong, according to Lukmanto (2022) Barong is a mythological creature that will help “Si Dulang” in his journey together later.

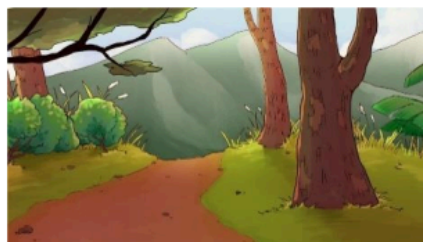


Figure 4. Artbook of “Si Dulang”
source: author’s documentation

After “Si Dulang” and Barong meet in Act 1, they go directly to Dulang’s village because Rangda, who is the antagonist in this animation, comes to the village and terrorizes the villagers. Barong, who had not fully recovered from his previous battle with Rangda, managed to defeat Rangda due to the help of Dulang's cooking which gave him a little extra energy. Below is Figure 5, where Act 1 takes place.



Figure 5. Trailer of “Si Dulang”
source: author's documentation

As stated by Hakim, Kim, and Hong (2009), Bali has a highland mountain landscape and a lowland beach landscape. The location where Barong and Dulang meet is on the mountain and the next act is in the beach area which is also located close to the village settlement as in the world map of “Si Dulang” in Figure 2. In creating the environment in Act 2, the concept artist refers to some pictures of beaches in Bali to be used as a reference for Figure 6.



Figure 6. Artbook of “Si Dulang”
source: author's documentation

From those references, the concept artist creates an environment design that adjusts to the needs of the storyline. Besides focusing on the depiction of the beach,

the concept artist also added several other visual elements to support the atmosphere of the environment as shown in Figure 7.



Figure 7. Artbook of "Si Dulang"
source: author's documentation

After creating assets to complete the beach environment, the concept artist adjusts the positioning of the asset around the main area of the story. In creating an environment, there are several things to consider, determining the placement of assets and building structures as background, middle ground, or foreground (Larasati & Sudaryat, 2020). In Act 2, some visual assets play an important role because the appearance will change because of the battle between Barong and Rangda. Figure 8 refers to the beach environment that happened before the battle of Barong and Rangda and the positioning of the assets, whether it becomes the background, foreground, or middle ground in this Act. The placement of assets such as trees, plants, buildings, and plates will determine the composition of the final look of Act 2. The placement of the plate in Act 2 will also be part of the Barong and Rangda battle area. As well as being a benchmark area that will be focused on for guests to watch this mapping project.

After the battle between Barong and Rangda, some buildings and other assets will be destroyed, as the concept artist has given important notes in Figure 8. The importance of this note is to provide further information on which areas and/or other things will be affected by the battle.

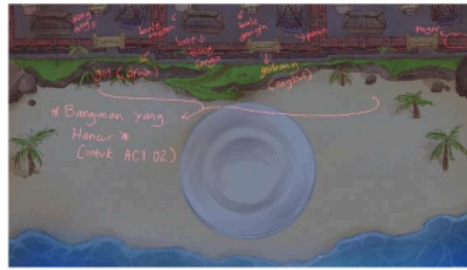


Figure 8. Artbook of “Si Dulang”
source: author's documentation

In Figure 8 there is a note in Indonesian which can be interpreted as "building that will be destroyed for Act 2". After the concept artist finishes the environment design for several acts, the concept artist will hand over to the illustrator to create the images that have been agreed upon between the two parties and finally 3D modeling will be made before finally being combined with the characters and displayed in this fine dining mapping project.

“Si Dulang” unfolds in the backdrop of Jakarta in 2022, where a young boy embarks on an epic culinary adventure to master diverse Indonesian cuisines in Bali. “Si Dulang’s” culinary acknowledgment is shown as he skillfully prepares Balinese dishes, each ingredient projected onto the dining table before the meal’s presentation. Guests are treated to a visual preview of their meal before indulging in its real, tangible counterpart. Creating the environmental setting for “Si Dulang”, particularly for Acts 1 and 2 set in Bali, proved to be a relative to the natural elements of Bali, with its majestic mountains and picturesque beaches, integrated into the animation’s landscape that can be seen in figure 9 and 10.



Figure 9. Artbook of “Si Dulang”
source: author's documentation

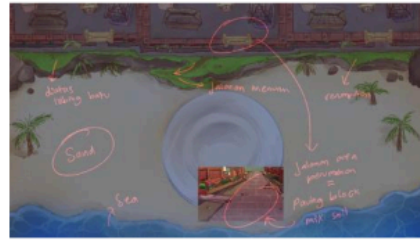


Figure 10. Artbook of “Si Dulang”
source: author's documentation

However, the real challenge emerged during the live execution phase, where the projected mapping came to life on the dining table. This execution provided valuable lessons for the researchers, emphasizing the importance of attention to the environment's visual composition, shape, arrangement, and color. Significantly, it revealed the complexities of aligning the design and dimensions of the projection-mapped plate with its real-world counterpart, particularly when dealing with image distortion on curved surfaces in both 2D and 3D animation in Figure 11. Furthermore, researchers found practical issues, such as barriers or lines separating tables, which required an innovative solution to blur the very obvious boundaries so as not to disrupt the experience of waiting and eating food as shown in Figure 11. Therefore, in the future, the researcher will do more testing of the projection mapping prototype to find the overall composition so that diners do not experience distraction due to composition mismatch or distortion of the visuals displayed while watching and waiting for the food to be served.



Figure 11. “Si Dulang” Table Project Mapping
source: author's documentation



Figure 12 .“Si Dulang” Table Project Mapping
source: author's documentation

CONCLUSION

The research team explored how to create a culturally and historically appropriate environment to support the character's storyline and Balinese food to be projected in a restaurant with a fine dining concept. The goal of this research is to introduce the local cultural location that is being visited by the protagonist while exploring the culinary archipelago, namely Bali by displaying illustrations of the environment in Bali at the dining table has been achieved. Intellectual property rights for the creation of Dulang and Barong characters were registered in November, and the prototype of the animated film and art book was completed in early 2022.

The concept of this visual environment can be projected in luxury restaurants. The data collection, data analysis, and production process took a lot of time and resources to realize "Si Dulang" hybrid animation projection mapping. The process of testing the prototype had to be done repeatedly to find the right composition and visual aspects according to the needs in the field such as the size of the table in each luxury restaurant that has its standards. Finally, in the future, to find references, do not just rely on search sites but come directly to the location so that you can explore more deeply what are the important elements in the environment around Bali.

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