

Revitalizing Nusantara Traditions through Interactive Cultural Experiences with Augmented Reality Technology

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Abstract— Advances in digital technology are opening up new opportunities for cultural preservation and promotion. Augmented Reality (AR), with its ability to blend the real and digital worlds, has the potential to bridge the gap between younger generations and the rich cultural heritage of the Nusantara. This research aims to develop an AR application called "Imersi Budaya Nusantara" Immersion into Nusantara Culture to revitalize Nusantara traditions through interactive and educational cultural experiences. The application is expected to increase interest and understanding of Nusantara culture among younger generations while serving as an example of utilizing technology for cultural preservation. The research utilizes the Model Development Life Cycle (MDLC), which includes the stages of concept, design, material collection, development, testing, and distribution. The application's content includes visualizations of traditional dances, houses, food, clothing, and music from various regions in Indonesia. The "Imersi Budaya Nusantara" application has been successfully implemented and tested. The results of functionality and usability testing indicate that the application performs well and is user-friendly. User experience evaluations, based on questionnaires, demonstrate high levels of engagement, enjoyment, and educational value. This research proves that AR technology is effective in increasing interest and understanding of Nusantara culture among the younger generation. The "Imersi Budaya Nusantara" application serves as a model for utilizing technology for cultural preservation, opening up opportunities for further development and related research.

Keywords— *Augmented Reality, Nusantara Culture, Cultural Preservation, Model Development Life Cycle, Technology, Tourism*

I. INTRODUCTION

In an increasingly fast-paced digital era, technology is not only a tool in everyday life but also plays an important role in preserving and promoting culture. One of the technologies with great potential in this field is Augmented Reality (AR) [1]. AR is a technology that can combine the real world with digital elements in real-time, creating a deep interactive experience for users [2]. In the context of Nusantara culture, this technology can serve as a bridge connecting the younger generation with a rich and diverse cultural heritage [3].

Nusantara, which is the term for the Indonesian archipelago, has an extraordinary cultural wealth, from Sabang to Merauke. Each region has its own unique traditions, customs,

arts, and folklore [4]. However, along with the currents of modernization and globalization, many of these cultural riches are beginning to be forgotten [5], especially among the younger generation who are more familiar with global popular culture than with their own ancestral heritage [6].

This is where AR technology can play a crucial role. By incorporating elements of Nusantara culture into engaging interactive experiences [7], AR can help revive traditions that may have begun to fade. Users can directly experience the beauty of traditional dances [8], regional specialties, typical local houses, regional clothing, and local music, without having to be physically present in those places. All of this can be accessed through smart devices like smartphones or tablets, which are certainly very familiar to the younger generation.

The use of AR for the revitalization of Nusantara traditions not only has the potential to preserve culture but also provides high educational value [9]. For example, in an educational setting, AR can be used as a more engaging and interactive learning aid [10], allowing students to learn about the history and culture of Nusantara in a more captivating way. In addition, the tourism industry can also leverage this technology to provide a richer and more immersive travel experience for both domestic and international tourists [11].

In a global context, the use of AR to preserve local cultures like that of the Archipelago can also help introduce Indonesia's rich cultural heritage to the international community [12]. This can strengthen national identity amid the currents of globalization and become a source of pride for the Indonesian nation. Thus, AR is not just a technology; it is a medium with great potential to be a guardian and successor of the cultural heritage of the archipelago for future generations [13].

Through AR technology, the traditions of the Archipelago can be revived [14], interpreted in a way that is relevant to the present, and most importantly, passed down to future generations in a form that they understand and appreciate.

II. RESEARCH METHOD

This research will use the Model Development Life Cycle (MDLC) to develop an Augmented Reality (AR) application aimed at revitalizing Nusantara traditions through interactive cultural experiences [15]. MDLC is a systematic approach in the development of technology-based systems, consisting of six main stages: concept, design, material collection, production, testing, and distribution [16].

The application of MDLC, as we can see in image 1, in this study will ensure that the resulting AR application meets user needs and the goals of cultural revitalization [17]. The concept stage will focus on defining the goals, features, and target users of the application. The design stage will involve creating storyboards, designing the user interface, and selecting appropriate AR technology [18]. In the material collection stage, researchers will gather digital content such as images, videos, and audio that represent the traditions of the archipelago. The development stage will include the creation of the application using the chosen software and AR technology [19]. Testing will be conducted to ensure that the application functions well, is user-friendly, and provides a satisfying experience. Finally, the distribution stage will involve publishing the application on relevant platforms and promoting it to the target users.

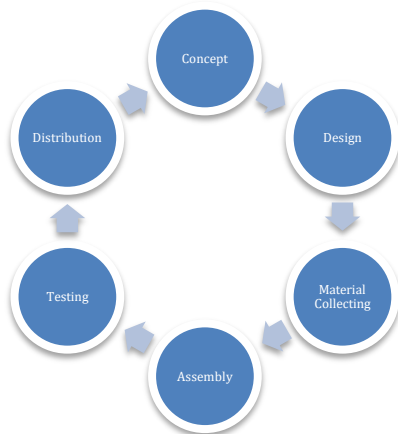


Figure 1. Model Development Life Cycle

A. Concept Stage

At this stage, the researcher will define the main objective of developing the AR application, which is to revive and promote the traditions of the archipelago through an interactive cultural experience. The research begins with identifying the needs of users, particularly the younger generation who are less exposed to the cultural wealth of the archipelago [20]. Researchers will also determine the scope and main features of the application, such as the visualization of traditional dances, regional specialties, traditional houses, local clothing, and traditional music. In addition, the researchers will conduct a market analysis to understand the trends in the use of AR technology within a cultural context.

This stage also includes in-depth research on the traditions of the archipelago that will be showcased in the application. It

involves gathering data from various sources such as books, articles, interviews with cultural experts, and visual documentation. Researchers will focus on the accuracy and authenticity of cultural representations in the application, ensuring that every visual element and information presented aligns with the true cultural heritage. In addition, the researchers will explore the latest and most relevant AR technologies to create an optimal user experience, including the use of object tracking, image recognition, and realistic 3D animations.

B. Design Phase

In this phase, the researcher will create an initial design of the AR application that includes the navigation structure, user interface, and interaction scenarios. This design will be presented in the form of wireframes and low-fidelity prototypes [21] that illustrate how users will interact with the cultural content of the archipelago presented in AR format. The researcher will also design the storyline and interactive content to be integrated into the application, taking into account the educational elements and cultural values that they wish to convey.

C. Material Collection Stage

In this phase, the researcher will create an initial design of This stage involves the collection and creation of materials that will be used in the application, including 3D models of cultural elements such as dances, traditional houses, food, and traditional clothing. Additionally, the researchers will gather supplementary data such as traditional music and folk tale narratives that will be presented in the application. The collection of materials is carried out in collaboration with cultural experts and local artists to ensure the accuracy and authenticity of the content presented.

D. Development Stage

At this stage, the development of the AR application will begin based on the designs and materials that have been collected. The development team will use AR software to integrate digital elements into the real environment [22], creating interactive experiences that can be accessed through smart devices such as smartphones and tablets. This development process is carried out iteratively, with adjustments and improvements made based on feedback from initial testing.

E. Testing Phase

After the AR application has been developed, the testing phase will be conducted to evaluate the functionality, usability, and effectiveness of the application in achieving the research objectives [23]. The testing was conducted involving participants from the target users, namely the younger generation, through usability testing and user experience evaluation. Feedback from this testing will be used to improve the application before the final distribution. This testing also involves cultural experts to ensure that the content presented aligns with the cultural values that are intended to be preserved.

F. Distribution Stage

The final stage of this research is the distribution of the AR application to users. The application will be distributed through digital platforms such as the Google Play Store, and will also

be promoted through social media [24]. Researchers will also conduct monitoring and evaluation post-distribution to measure the impact of the application in revitalizing Nusantara traditions and its acceptance by users. The data obtained from this stage will be used for further development and subsequent research

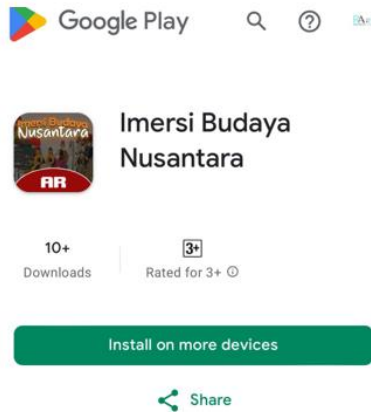


Figure 2. Application on Google Play

With the MDLC approach, this research will not only produce a well-functioning AR application but also ensure that the application is relevant, beneficial [25], and capable of making a real contribution to preserving and promoting the cultural traditions of the archipelago to the younger generation.

III. RESULT AND DISCUSSION

With Cultural Immersion of the Archipelago, we not only see but also feel and directly experience the richness of Indonesian culture in a new and exciting dimension. AR technology is changing the way we view history and culture, making it more accessible and understandable. This is not just an application; it is a window to a vibrant and wondrous world, where every corner is a story waiting to be uncovered.



Figure 3. Home page of the Nusantara Cultural Immersion

A. Functionality and Usability Testing

The developed application was tested involving the target users, namely the younger generation. This test aims to evaluate the functionality and usability of the application in the context of everyday use. The results of the testing indicate that this application has a high level of functionality, with all main features working well without any significant technical issues. The usability of the application also received a good score, where users felt comfortable and found it easy to navigate the app and understand the content presented. In the functionality testing using the black box method, each button and aspect of

the Nusantara Cultural Immersion application was evaluated. The functionality test results can be seen in Table 1.

Parameter	Test Results		
	Smart phone A	Smart phone B	Smart phone C
Opening the Application	Successful	Successful	Successful
AR Scan Button	Successful	Successful	Successful
Sound Button	Successful	Successful	Successful
Marker Function	Successful	Successful	Successful
About Button	Successful	Successful	Successful
Profile Button	Successful	Successful	Successful
Home Button	Successful	Successful	Successful
Back Button	Successful	Successful	Successful
Exit Application Button	Successful	Successful	Successful
Dance Button	Successful	Successful	Successful
Food Button	Successful	Successful	Successful

Table 1 shows the results of the functionality testing of the Augmented Reality (AR) application on three different types of smartphones. This testing includes various main functions of the application to ensure that everything is working properly.

In general, all the main functions of the application, such as opening the app, the AR scan button, the voice button, and the marker function, work well on the three tested devices. (Smartphone A, B, dan C). This indicates that the application can be accessed and used smoothly on various smartphones. Important buttons such as About, Profile, Home, Back, and Exit Application also operate without issues, making navigation and use of the application easy.

Specific features, as shown in images 3 and 4, such as the landmark button, the Dance and Food button, which allow users to access cultural content from the archipelago in AR format, also work well on all devices:



By pressing this landmark menu button, the application will display cultural houses / regional specialties. Users can view historical images and receive AR guides that bring us closer to those locations.

The image shows a screenshot of an application that appears to focus on exploring cultural landmarks. A pixel-style map is visible with a large building in the center, likely a representation of an important landmark. At the bottom of the screen, there are several menu icons, including one labeled "Landmark." The other icons represent different features such as "Dance," "Food," "Traditional Clothing," and "Profile." The

overall appearance of this application is simple and easy to navigate, with retro-style graphics that may appeal to users who appreciate classic aesthetics



This button activates the AR feature that allows users to witness traditional dances from various regions in Indonesia interactively. When the button is pressed, users will be directed to an interface displaying a list of traditional dances from different provinces in Indonesia. After selecting the desired dance, users can point their device's camera at a flat surface and watch a 3D animation of the dance appear on the screen, as if it were being performed live right in front of them. This feature is also equipped with detailed information about the dance, including its history, the meaning of the movements, and the costumes used, allowing users to not only enjoy the visual beauty but also gain in-depth knowledge about the cultural heritage.

The results of this testing indicate that the AR application has met the expected functionality standards, providing a stable and satisfying user experience. With all the main features functioning as they should, the application is ready to be used for the interactive and educational revitalization of Nusantara traditions. In addition, positive feedback from users and cultural experts indicates that this application has successfully created an engaging, immersive, and culturally accurate experience.

This application not only successfully presents cultural information in an easily understandable way, but also manages to spark curiosity and appreciation for the cultural heritage of the archipelago. The ease of navigation and intuitive interface make this application accessible to various groups, especially the younger generation, which is the primary target. Thus, the AR application "Nusantara Cultural Immersion" has great potential to be an effective tool in preserving and promoting Indonesian culture in the digital era.

B. User Experience Evaluation

This test also involves evaluating the user experience, which includes aspects of engagement, enjoyment, and education. The evaluation results show that this AR application successfully creates an engaging and immersive experience for users. The cultural elements integrated into the application, such as dance, traditional houses, and music, received positive responses from users, who feel that the app is not only entertaining but also provides new insights into the richness of the archipelago's culture. Users also appreciate the educational aspect of the application, which is presented in a way that is neither boring nor difficult to understand.

In addition, users also reported an increase in their motivation to learn more about the cultures of the archipelago after using this application. They feel that this application

provides a fun learning experience that is different from traditional learning methods. Interactive features such as 3D visualization and dance animations allow users to "experience" culture firsthand, thereby enhancing their understanding and appreciation. Overall, the evaluation of the user experience shows that the "Nusantara Cultural Immersion" application has successfully achieved its goal of creating an engaging, in-depth, and educational learning experience about Indonesia's cultural heritage

C. Testing by Cultural Experts

In addition to testing by general users, this application was also evaluated by cultural experts to ensure that the content presented aligns with the cultural values of the archipelago that are intended to be preserved. The results of the testing indicate that the application successfully presents cultural elements accurately and authentically. Cultural experts also provided constructive feedback to enhance the representation of several cultural elements to better fit their original context, which was subsequently implemented in the application's improvements.

The results of this research indicate that the developed AR application successfully achieved the main objective of the study, which is the revitalization of Nusantara traditions through interactive cultural experiences. The use of AR technology has proven effective in attracting the interest of the younger generation towards traditional culture, which may have been less known or forgotten until now. This application not only provides an engaging and interactive experience but also serves as an educational medium that can convey cultural information in a way that is relevant and easily understood by the current generation.

In terms of development, the MDLC approach used has proven to effectively guide the development process, from concept design to application distribution. Each stage in the MDLC contributes significantly to the final success of the application, ensuring that the resulting product is not only functional but also possesses high cultural and educational value.

The tests conducted show that this application has a high level of functionality and usability, with positive responses from target users and cultural experts. The evaluation of the user experience confirms that this application is capable of creating a deep and enjoyable experience while effectively conveying the cultural values of the archipelago.

Overall, this research makes a significant contribution to the field of cultural preservation through digital technology. The AR application developed not only successfully attracted the interest of the younger generation towards Nusantara culture, but also opened new opportunities for the use of technology in preserving and promoting local culture in this digital era. The results of this research also provide a strong foundation for further development, with the potential for expansion into other cultural elements that have not yet been covered in this initial version of the application.

IV. CONCLUSION

The results of this research indicate that the AR application "Nusantara Cultural Immersion" successfully achieved its goal of revitalizing Nusantara traditions through an interactive cultural experience. Functionality and usability testing confirmed that this application works well and is easy to use across various devices. In addition, the evaluation of user experience shows a high level of engagement, enjoyment, and education, indicating the success of the application in presenting cultural content that is appealing and meaningful to the younger generation.

Previous similar research, such as that conducted by Abdurrahman in the *remik* journal [26], also demonstrated the great potential of AR in cultural preservation. However, this research has the advantage of a broader content scope, covering various aspects of Nusantara culture such as dance, traditional houses, food, and traditional music. In addition, the use of the MDLC approach in application development ensures that each stage of development is carried out systematically and structurally, resulting in a high-quality product that is relevant to user needs.

The results of this study align with other research that shows that AR technology can be an effective tool in enhancing engagement and understanding of culture. In Bakti's study, published in the journal *Zonasi* [27], AR proved to create a more engaging and interactive learning experience compared to traditional teaching methods. This is also reflected in the evaluation results of the user experience of the "Cultural Immersion of the Archipelago" application, where users felt more connected to the culture of the Archipelago and gained a deeper understanding through the AR experiences presented.

However, this research also identifies several challenges and potential for further development. Although this application has successfully attracted the interest of the younger generation, further efforts are needed to ensure the sustainability of its use and long-term impact on cultural preservation. Additionally, expanding the content and features of the application, as well as integrating it with other technologies such as artificial intelligence, could enhance the user experience and broaden the application's reach.

Overall, this research provides strong evidence that AR technology has great potential in revitalizing Nusantara traditions and introducing Indonesia's cultural wealth to the younger generation. The "Nusantara Cultural Immersion" application is a promising first step in utilizing technology for cultural preservation, and the results of this research can serve as a foundation for further development and related studies in the future.

This research shows that AR technology can be a very effective tool in preserving and promoting the culture of the Archipelago. By making traditions and cultural elements more accessible and understandable for the younger generation, this application serves not only as an educational medium but also as a bridge connecting the past with the future. AR technology opens new opportunities for cultural preservation and demonstrates how digital technology can be used to safeguard local cultural wealth amidst the tides of globalization.

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