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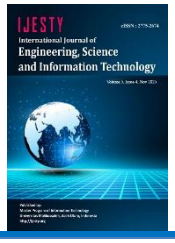

Immersive Digital Data Asset as a Digital Preservation Model for Tangible and Intangible Culture Towards the Indonesia Archipelago Metaverse

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Abstract

This research embarks on a critical mission to develop and comprehensively evaluate the Immersive Digital Data Asset (IDDA) model, positing it as an innovative and robust cloud-based framework. This framework is meticulously designed for the digital preservation of Indonesia's exceptionally rich and diverse tangible and intangible cultural heritage, a crucial endeavor situated within the rapidly emerging and transformative landscape of the Indonesia Archipelago Metaverse. The study directly confronts and seeks to mitigate significant, persistent challenges prevalent in current cultural digitalization efforts across the nation. These challenges notably include the pervasive limited access to advanced technological infrastructure in many remote and underserved areas, compounded by the inherently high development and ongoing maintenance costs associated with cutting-edge immersive technologies. To achieve its objectives, this research rigorously employs a Systematic Literature Review (SLR) methodology. This approach allows for a meticulous analysis of existing academic trends, a systematic identification of crucial gaps within the current literature pertaining to digital cultural preservation, and a synthesis of best practices. The compelling findings unequivocally demonstrate the profound and multifaceted potential of the IDDA model. It serves not only as a powerful tool for safeguarding invaluable cultural assets from degradation and loss but also as a catalyst for fostering dynamic interdisciplinary research collaborations, both domestically and internationally. Furthermore, the model is shown to significantly stimulate the creative economy across Indonesia by enabling new forms of cultural expression and monetization within the digital realm. Nevertheless, the successful, widespread, and sustainable long-term implementation of the IDDA model is critically contingent upon substantial and concerted improvements in technological accessibility nationwide, ensuring equitable participation. This also necessitates a sustained, strategic, and collaborative investment from various stakeholders in its continuous development, infrastructure enhancement, and content creation to fully realize its transformative potential for Indonesia's cultural future.

Keywords: *Cultural Heritage Preservation, Cultural Artifacts, Immersive Technology, Indonesia, Intangible Cultural.*

1. Introduction

Indonesia, an archipelagic country with thousands of islands, has an enormous wealth of cultural heritage, both tangible and intangible. Intangible cultural heritage, such as language, music, dance, and rituals, shapes a nation's identity and sustainability. However, the challenges in preserving cultural heritage are increasing in the era of rapid globalization and digitalization. There is a significant gap between traditional ways of preserving cultural heritage and the demands and opportunities offered by modern digital technologies.

The development of information and communication technology (ICT) has brought significant changes to almost all aspects of life, including the way we preserve and disseminate cultural heritage. Immersive technologies such as Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR) offer new opportunities to present intangible cultural heritage in a more interactive and immersive experience [1]. This technology allows people to understand and appreciate cultural heritage in a more dynamic, exciting and accessible way [2].

Various projects worldwide have demonstrated the effectiveness of immersive technologies in cultural preservation. For example, photogrammetry at historic sites in Italy allows virtual visitors to explore the sites through VR, providing a more realistic and immersive experience [3]. In Indonesia, several initiatives have utilized AR technology to document and promote traditional Toraja dance, an example of how this technology can help preserve culture.

However, several vital challenges still must be overcome in preserving cultural heritage in the digital era. The problems faced include keeping cultural heritage relevant and attractive to the younger generation, who tend to be more connected to the digital world [1]. How can cultural heritage be widely accessed by the community, especially amidst limited physical interaction? What innovative methods can be used to document and promote cultural heritage that is threatened with extinction.

To address these pressing challenges, this research specifically aims to develop a comprehensive Immersive Digital Data Asset (IDDA) model and evaluate its efficacy as a digital solution for documenting, promoting, and educating the public about Indonesia's cultural heritage through immersive and interactive experiences. The IDDA will utilize AR, VR, and MR technologies to present tangible and intangible cultural heritage in a dynamic digital form accessible to the broader public.

Augmented Reality (AR) and Virtual Reality (VR) technology have rapidly progressed and been applied in various sectors, such as education, industry, and health [3]. However, one gap remains in integrating high-quality immersive content that can be adapted to cultural contexts. Creating engaging and interactive AR/VR content remains a challenge, especially given the availability of more advanced platforms and development tools.

The novelty of this research lies in integrating immersive technology with tangible and intangible cultural heritage and developing the IDDA model as a platform that can be accessed via mobile devices. This allows for broader dissemination and more dynamic and educational interactions for users. In addition, this research will produce digital standards for managing and preserving culture in the context of the metaverse, which has great potential to strengthen Indonesia's cultural identity in the global era.

2. Literature Review

2.1. Immersive Digital Data Asset (IDDA)

Immersive Digital Data Asset (IDDA) is a concept developing in digital cultural preservation, primarily to address the challenges of preserving cultural heritage in an increasingly digitally connected modern era. IDDA uses immersive technologies such as Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR) to document, promote, and educate the public about cultural heritage through a more interactive and immersive experience [4]. This approach offers digital solutions that can reach more people and increase public engagement, especially the younger generation, who are more accustomed to digital technology.

In the context of cultural preservation, Indonesia is faced with a big challenge: ensuring that tangible and intangible cultural heritage can survive and remain relevant amidst rapid changes in times. Rapid globalization and digitalization increasingly threaten traditions, languages, dances, and traditional ceremonies that are part of the nation's identity [5]. In this case, IDDA can be an effective tool to bridge the gap. By creating cultural assets in digital format that can be widely accessed, IDDA allows the public to experience culture directly through digital media. This is in line with research that shows that digitalization of cultural assets can effectively protect cultural heritage vulnerable to time and social change.

Immersive technologies also offer new ways to approach cultural heritage that are impossible with traditional preservation methods. For example, Augmented Reality (AR) allows digital elements to be displayed on top of the natural world so that cultural objects can be seen from a new angle or accompanied by additional information. In this field, Virtual Reality (VR) also allows the simulation of cultural environments that make users feel like they are in an actual location [6]. For example, research in Italy used VR to preserve cultural sites, allowing virtual visitors to explore historic sites in real time, even though they were not physically there.

Additionally, Mixed Reality (MR) combines elements of VR and AR to enable deeper interactions between users and cultural objects. This can create a richer experience where users view and interact with cultural assets in digital format. According to Peffers et al. (2007), immersive technologies such as VR and AR can not only help in conservation [7], but They can also increase people's understanding and appreciation of cultural values that the younger generation may have forgotten or are unaware of.

IDDA model development also includes elements of Design Science Research Methodology (DSRM), which involves several stages from problem identification to implementation of solutions that can be used in real-world scenarios [8]. The first stage is collecting data on cultural assets through collaboration with cultural heritage experts and local communities. Once the data is collected, the next stage is to create a digital model that can be integrated into an immersive platform. Through this process, IDDA can provide an interactive experience that is not only interesting but also informative. According to Dang et al. (2023), digital twin-based approaches have proven highly effective in preserving cultural heritage sites in China, allowing real-time and historical data to be combined to create accurate digital representations.

The innovation presented by IDDA focuses on preserving culture and strengthening national identity on the global stage. Using advanced technology and a widely accessible platform, this project can become a model for other countries wishing to preserve their cultural heritage amidst the challenges of modernization [9]. As a form of digital preservation, IDDA also has excellent potential for use in education, tourism, and research, making a real contribution to global efforts to keep cultural heritage alive and enjoyed by future generations.

2.2. Cultural Digitalization

Cultural digitalization is one of the strategic efforts to face the challenges of globalization and the rapid development of information technology. In an era where almost everything can be accessed through digital technology, preserving cultural heritage both tangible and intangible—must adapt to the needs of the times. Cultural digitization allows cultural assets to be accessible to a broader audience across geographic boundaries and stored in more durable formats [10]–[12]. This process involves not only transferring cultural objects to the digital world but also efforts to maintain that culture's authenticity, historical value, and relevance for future generations.

Immersive technologies such as Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR) provide excellent opportunities for the digitalization of culture. With this technology, culture that previously could only be enjoyed in specific locations, such as museums or cultural heritage sites, can now be accessed virtually from anywhere [13]. For example, AR technology allows users to animate interactive experiences, such as dancing with traditional dancers or exploring historical relics as if they were in real places. This not only increases accessibility but also creates a more immersive and personalized experience, which can spark new interest in cultural heritage among younger generations.

Cultural digitalization also has great potential in education and promotion. For example, immersive technology can revive cultures at risk of extinction, such as regional languages that are increasingly rarely used. This language can be taught to the younger generation interestingly and interactively through digital applications [14]. Conversely, cultural promotion can also be done through digital

platforms that reach a global audience. Culture-based tourism, for example, can be introduced through virtual tours, which show potential international tourists the beauty of local culture.

However, behind this great opportunity, some challenges must be faced in cultural digitalization. One of the main challenges is maintaining the authenticity and accuracy of digitized cultural assets. When a culture is transferred to a digital format, there is a risk that the original meaning or essence may be lost or distorted [15]. Therefore, cultural experts must be involved in the digitalization process to ensure that the cultural values contained are maintained. Intellectual property rights and privacy issues must also be a concern, mainly when local, communal culture is accessed globally.

According to literature outside the article reference, such as research conducted by Jones et al. (2020) in the journal Cultural Heritage in the Digital Age, cultural digitalization is not only about visual or audio documentation but is also related to the development of data infrastructure that can support the safe and sustainable storage and dissemination of culture. Jones emphasized the importance of integrating blockchain technology in maintaining the authenticity of digitized cultural data, mainly to ensure that the data is not altered or stolen in the distribution process [16]. The use of blockchain in cultural digitalization can be one solution to facing data security and privacy challenges.

Furthermore, the book "The Future of Heritage Preservation" by Linda Garcia (2019) develops the concept that cultural digitalization should focus on preservation aspects and community involvement. According to Garcia, local communities, especially communities with cultural assets, must be actively involved in digitalization [17]. This is important so that the results of digitalization are not just technical products but also have a solid emotional and social connection with the community of origin. This participatory approach also helps overcome the challenges of intergenerational interaction, where technology can bridge older and younger generations in preserving their culture.

The digitalization of culture is not just a technological transformation but also part of a holistic strategy to preserve, educate and promote culture in an increasingly digitally connected world. Research and books beyond the article's references emphasize the importance of integrating modern technology with social and community approaches, ensuring that cultural heritage remains relevant and valued by current and future generations.

2.3. Metaverse Nusantara

Metaverse Nusantara has a big vision to bring Indonesian culture into the digital world through immersive technologies such as Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR). In this concept, Indonesia's tangible and intangible cultural wealth will be digitized and presented in a virtual ecosystem that allows global access and direct community involvement in cyberspace [17]. This idea is hoped to bridge the gap between the younger generation, who are increasingly connected to technology, and the richness of traditional culture that needs to be preserved. Metaverse Nusantara can be an effective medium for introducing and maintaining cultural values that may have begun to be forgotten amidst modernization and globalization.

According to research presented in various journals, such as "Digital Cultural Heritage in the Age of Metaverse" by Wilson & Smith (2021), the digitalization of culture through the metaverse not only provides more comprehensive access but also enriches interactive experiences [18]. They emphasized that community involvement, especially for the younger generation, is significant in maintaining cultural sustainability. Metaverse allows this culture to be presented in attractive forms through virtual experiences that allow users to recreate historical sites, traditional dances, or folklore displayed with AR and VR technology [19]. This will increase appreciation of Indonesia's cultural heritage and foster a sense of cultural identity among the wider community.

In her book The Future of Cultural Preservation, Linda Garcia also highlights the importance of active community participation in cultural digitalization. According to Garcia, the involvement of local and indigenous cultural communities in creating digital content is very important to maintaining the authenticity of that culture in cyberspace. Otherwise, there is a risk that cultural representation in the metaverse will lose its core values and become simply a commercial product disconnected from its social and historical context [20]. This concept is in line with Metaverse Nusantara, where the involvement of local cultural communities in creating digital assets such as Immersive Digital Data Asset (IDDA) is significant to ensure that the culture presented remains true to its original essence.

Furthermore, cultural digitalization within the Nusantara Metaverse framework has great potential to improve the creative economy. Local developers, artists, graphic designers, and content creators can be involved in creating culture-based digital assets that can be sold or marketed through metaverse platforms [21]. Robert Jenkins's book Cultural Economy in the Digital Era (2020) emphasizes that cultural digitalization can encourage creative economic growth by providing space for local artists to exhibit and monetize their work on global platforms. In Indonesia, this can create new economic opportunities for cultural communities that have previously found it challenging to connect with global markets [22].

However, the big challenge in developing Metaverse Nusantara is maintaining the authenticity and suitability of digital representations of Indonesian culture. Jones et al. (2022), in the article "Digital Authenticity in Cultural Preservation", show that digitalization often ignores essential elements of original culture that are difficult to translate into digital format. This risks making the cultural heritage that has been immortalized lose its original essence or become too distorted when presented on the metaverse platform [23]. Therefore, a more sensitive approach is needed. Technology must be combined with local knowledge and wisdom from cultural experts to maintain harmony between digital forms and traditional values.

Metaverse Nusantara also opens up great opportunities for cultural education. By presenting culture in an immersive digital format, educational institutions can use this platform as a more engaging learning tool for students. Outside formal education, virtual cultural tourism can become a new form of tourism, where people worldwide can explore the richness of Indonesian culture without being physically present. Research by Sanchez and Alvarez (2020) in the journal Heritage and Digital Innovation emphasizes that virtual cultural tours not only increase accessibility but also broaden the attractiveness of that culture in the eyes of foreign tourists [24]. With Metaverse Nusantara, users can visit and explore Indonesia's historical sites, such as the Borobudur Temple or the Yogyakarta Palace, in virtual form, offering a rich and immersive experience.

In conclusion, Metaverse Nusantara is the future of preserving and promoting Indonesian culture, which has excellent potential for expanding access, increasing appreciation, and empowering the creative economy. However, developing this concept requires a holistic approach involving advanced technology and active participation from the local cultural community. In addition, it is essential to balance technological innovation and respect for indigenous cultural values so that Metaverse Nusantara can become a beneficial platform for current and future generations.

3. Methods

This research uses a Systematic Literature Review (SLR) approach to identify, analyze and summarize research related to data model development in the context of cultural preservation using immersive technology. SLR is a systematic and structured method of searching and evaluating relevant literature to ensure that all critical information has been reviewed thoroughly and is reliable.
The primary aim of this study is to develop a robust data model for storing and managing digital cultural assets based on immersive technologies such as Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR). The main focus is how this data model can be used to store cultural information in a way that is safe, efficient and accessible to the public while paying attention to important aspects such as validity, authenticity and long-term sustainability of the data [25].
This study's inclusion criteria include articles and research that focus on the use of immersive technology in cultural preservation, digital asset management, and digital data storage systems. Exclusion criteria, on the other hand, included studies that were not relevant to the topic of cultural preservation or that did not provide empirical data supporting the development of data models for cultural digital assets.
Literature searches were conducted through leading academic databases such as IEEE Xplore, Scopus. Keywords used in the search included "immersive technology in cultural preservation," "data model for cultural heritage," "AR/VR in digital heritage," and "digital data management in cultural preservation." The literature obtained was then reviewed in depth to select the most relevant and high-quality research based on predetermined inclusion criteria [1].
Data collected from the literature will be analyzed using a thematic approach to identify trends, gaps and opportunities in research related to data models and immersive technologies [26]. The results of this analysis will be used to develop a comprehensive data model framework and propose relevant standards for digital-based cultural preservation [27].
The modeling in this research utilizes a Design Science Research approach, where the process begins with Problem Identification and Motivation, specifically problem-centered initiation. Next, at the Objective for Solution stage, the IDDA model is developed[28]. Subsequently, it proceeds to Design and Development, where the IDDA prototype is created. Following this, the concept and prototype are evaluated at the Demonstration and Evaluation stage [29]. Finally, the results of this process are disseminated through communication in the form of dissemination this method can be seen in Figure 1.

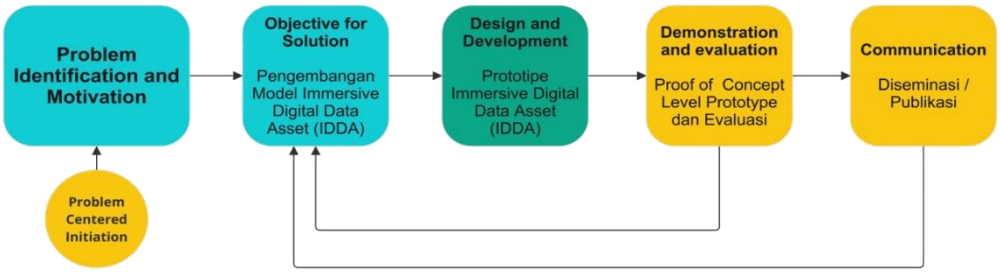

Fig 1. Design Science Research

4. Result and Discussion

4.1. Result

A search in the Scopus database revealed that 103 journals were found regarding Immersive Digital Data Assets from 1982 to 2024. However, articles on digital cultural preservation models were not found, especially in the Indonesian archipelago metaverse. This can be seen in Figure 2 below

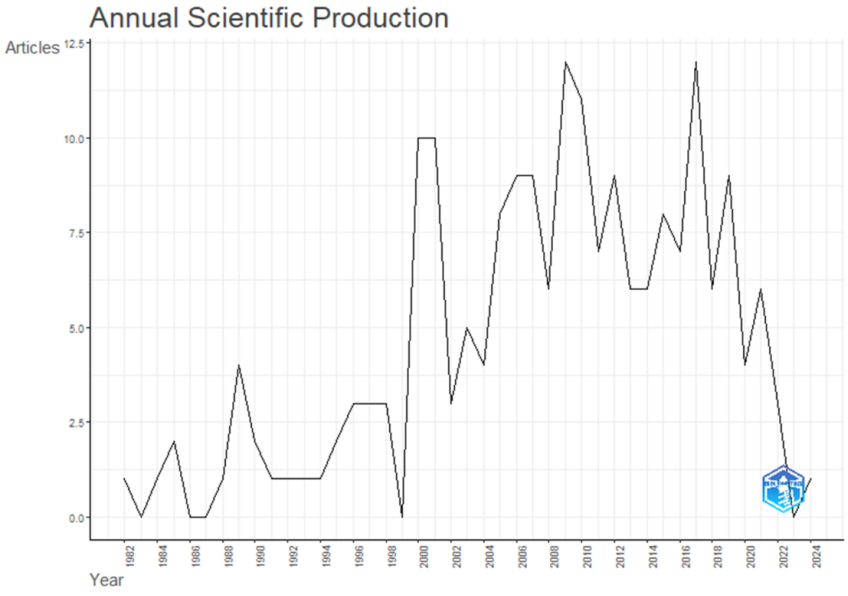

Fig 2. Annual Production

The graph in Figure 2 shows fluctuations in the number of published articles related to this topic. Even though there was an increase in scientific production from 2000 to around 2018, a significant downward trend occurred after that year until 2024 [30]. This indicates that interest in the topic of Immersive Digital Data Assets exists, but unfortunately, Indonesia's metaverse-based cultural preservation aspect has not been well represented. Adequate in published research.
If we look at the number of publications and the impact on other publications, no articles for digital cultural preservation models, especially the Indonesian archipelagic metaverse, were found. This can be seen in Figure 3.

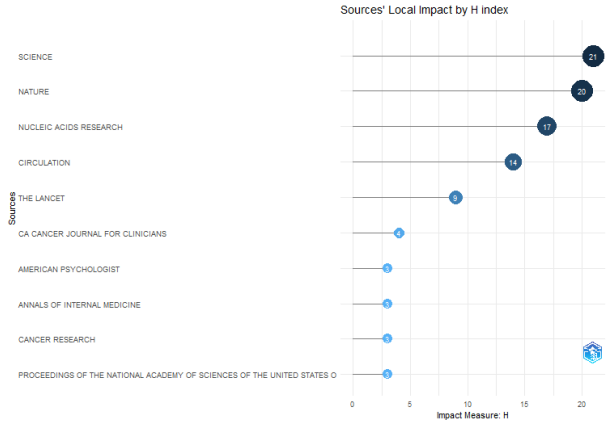

Fig 3. Publication H-Index

Let us look at the H-index graph in Figure 3. No publications specifically discuss digital cultural preservation models, especially those related to the metaverse for the Indonesian Archipelago[31]. The graph shows the impact of various publications related to Immersive Digital Data Asset based on the H-index and the number of citations received. From this, it can be seen that although several studies have significantly impacted the number of citations and H-index, there needs to be articles that focus on aspects of digital culture preservation in Indonesia.
This confirms that this topic is still not a significant concern in existing research, both in the number of publications and the influence of its citations on another research. The opportunity to further explore how the metaverse can be used to preserve Indonesian culture is still wide open and requires more attention from researchers.

4.2. Immersive Digital Data Asset Indonesia Archipelago Metaverse Model

Immersive Digital Data Asset Indonesia Archipelago Metaverse Model is a cloud-based data storage modelling model designed to support the preservation of Indonesian culture, both tangible and intangible, in the context of metaverse development [32]. This model focuses on the digital preservation of cultural assets in the Indonesian archipelago, using cloud technology to store, manage and access data safely and sustainably.
The main goal of this model is to create a platform that allows Indonesian cultural data, such as artefacts, architecture, dance, music, folklore, customs, and language, to be thoroughly documented and accessible to current and future generations through immersive technology such as the metaverse [33]. In this metaverse ecosystem, this cultural data can be brought to life virtually, providing a rich experience for users to experience and learn about Indonesia's cultural heritage more interactively and engagingly.
One example of the Indonesian immersive digital asset data archipelago metaverse model is https://nusaheritage.id/. The Nusa Heritage ID website focuses on preserving and documenting Bali's cultural heritage, both tangible (tangible), such as temples and sacred sites, and intangible (intangible), such as traditional ceremonies and dances [34]. This site provides complete information on various aspects of Bali's cultural heritage, including photos, videos, and 3D objects, so that visitors can understand and appreciate the richness of Balinese culture.
The Nusa Heritage ID website uses the storage method in Figure 4 to store data.

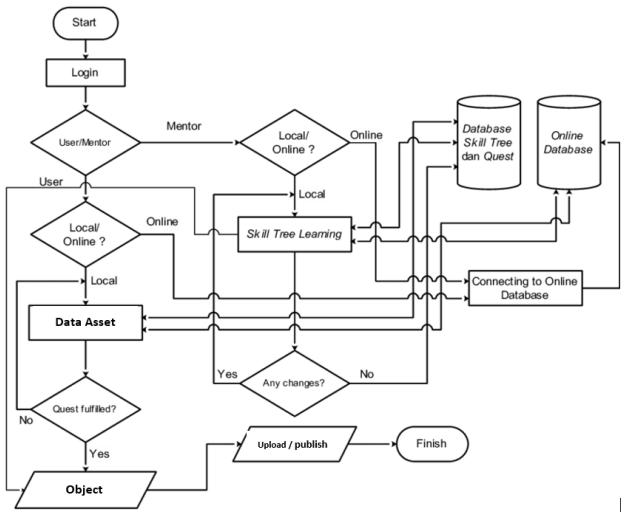

Fig 4. Nusa Heritage ID Storage Flowchart

The process begins with login, where the user or mentor determines whether they want to access the data locally or online. After that, users can access learning materials, both locally and online. The data is updated and saved into the skill tree if there are changes. After completing the quest, the user gets confirmation from the mentor [35]. The data is then updated to an online database, and the process is complete once the mentor confirms that all quests are fulfilled.

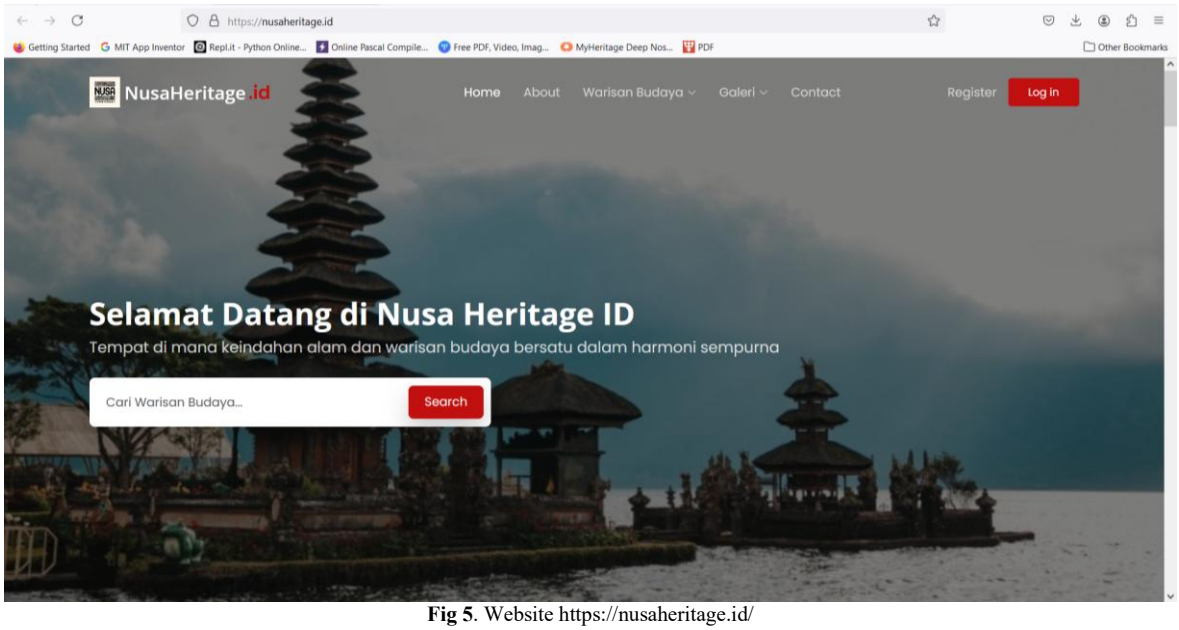

Fig 5. Website https://nusaheritage.id/

4.3. Advantages Immersive Digital Data Asset Indonesia Archipelago

Immersive Digital Data Asset Indonesia Archipelago has several advantages in terms of preserving Indonesian culture, both tangible and intangible, in the digital era. First, this model uses cloud-based technology[36], which allows for secure and long-term storage and management of cultural data. Stored data is not only protected from physical risks such as damage or loss but can also be accessed easily at any time and from anywhere.

Second, this model provides users with a more vivid experience through immersive technology, such as a virtual tour or traditional cultural simulation in 3D and interactive format. Users can experience Indonesian culture as if they were in its original place, creating an immersive, educational and interactive experience.

Third, this platform also contributes to the development of the creative economy. Combining Indonesia's cultural heritage in digital format opens new opportunities for artists [37], technology developers, and cultural actors to utilize cultural data to create digital-based products or services, such as virtual works of art, interactive applications, and others.

Fourth, Immersive Digital Data Assets also support international collaboration in terms of cultural preservation. Researchers, curators, and cultural actors from various parts of the world can access this data, collaborate with it, and contribute new knowledge or technology to preserve and promote Indonesia's cultural riches in the global realm.

4.4. Disadvantages Immersive Digital Data Asset Indonesia Archipelago

Immersive Digital Data Asset Indonesia Archipelago has several shortcomings that need to be noted. One of the main weaknesses is limited access to technology in many areas of Indonesia, especially remote areas that may not have adequate internet infrastructure [38]. This makes access to digital cultural data stored online difficult for parts of society that would otherwise benefit from this model.

Additionally, while immersive technologies can offer near-real experiences, there are significant differences between digital experiences and direct interactions with culture. Users may miss emotional elements and physical interactions that can only be experienced in the original context [39]. This creates a gap between the authenticity of the physical cultural experience and the digital representation in the metaverse.

Furthermore, the costs of developing and maintaining this technology are high, from infrastructure development and cloud-based storage to developing immersive content [40]. Such a model requires significant funding for initial implementation and long-term sustainability, which can be a major challenge if not supported by stable investment.

Data security and privacy are also aspects that need to be considered. Storing cultural data in the cloud presents security risks, such as the threat of data theft or manipulation of cultural information. In addition, it is essential to protect this cultural heritage from unauthorized use or excessive commercialization without permission.

4.5. In-depth Discussion of Findings and Novelty

The findings from the systematic literature review, as depicted in Figure 2 and Figure 3, unequivocally highlight a significant research gap concerning digital cultural preservation models, particularly those integrated with the Indonesian Archipelago Metaverse. Despite a general interest in "Immersive Digital Data Assets" as evidenced by 103 journals from 1982-2024, there is a notable absence of publications directly addressing the unique intersection of immersive technology, Indonesian cultural heritage, and the metaverse concept. The declining trend in scientific production on this specific topic since 2018, coupled with the low H-index impact for related publications focusing on Indonesian digital culture, underscores this critical void in academic discourse.

This research directly addresses this gap by proposing the Immersive Digital Data Asset (IDDA) model. The novelty of the IDDA model lies in its comprehensive, cloud-based framework designed specifically for the digital preservation of both tangible and intangible Indonesian cultural assets within a metaverse context. Unlike existing general immersive data asset concepts, IDDA is tailored to the unique complexities and richness of Indonesian culture. The integration of mobile accessibility for the IDDA platform further enhances its novelty, promoting broader dissemination and more dynamic, educational interactions for users across the archipelago, including remote areas. The Nusa Heritage ID website serves as a practical example, demonstrating the potential of such a model in documenting and presenting Balinese cultural heritage through a structured digital flow (Figure 4) and an accessible online interface (Figure 5). This model's ability to bring cultural data to life virtually, offering immersive experiences that transcend geographical limitations, represents a significant advancement in cultural preservation strategies for Indonesia.

Furthermore, the study's emphasis on fostering research collaboration and stimulating the creative economy through the IDDA model presents a novel socio-economic dimension. By providing a platform for artists, developers, and cultural actors to create digital products and services based on Indonesian heritage, IDDA moves beyond mere preservation to active cultural monetization and global promotion. This multi-faceted approach, combining technological innovation with cultural and economic development, distinguishes the IDDA model as a pioneering effort in the field of digital cultural heritage.

5. Conclusion

It is essential to highlight that Immersive Digital Data Asset Indonesia Archipelago presents a new model for cultural preservation through digital technology, but it has its challenges. Although it has excellent potential in documenting and preserving tangible and intangible culture, technological infrastructure constraints in remote areas limit accessibility. Additionally, although immersive technology allows for more vivid cultural experiences, there remains a difference between live and digital experiences.

The high cost of technology development is also one of the main drawbacks, considering that maintaining cloud-based systems and producing immersive content requires significant resources. This model requires stable investment to function in the long term. Data security and privacy are also essential concerns because cultural data stored in the cloud is vulnerable to risks such as theft or misuse of information.

Nevertheless, this model still brings excellent benefits, including promoting Indonesian culture globally, supporting collaboration between researchers, and opening creative economic opportunities by developing culture-based digital products. However, more research needs to be done, especially in the context of applying the metaverse to preserve Indonesian culture.

Immersive Digital Data Asset the Indonesia Archipelago is a significant innovation in preserving Indonesia's cultural heritage in the digital era. This model offers secure storage and global access for tangible and intangible cultural assets such as physical artefacts, traditions, and customs. This model allows current and future generations to experience Indonesian culture through interactive and immersive digital technology. This also encourages research collaboration between countries and supports the development of a culture-based creative economy.

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