

Digital Renaissance of African Heritage: Navigating Ownership, Representation, and Equitable Access in the Virtual Realm

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Abstract

The increased worldwide spending on digital transformation has changed the way audiences engage with cultural heritage. However, the digitalization of African heritage is facing multiple challenges including disputed ownership rights of cultural artifacts, inability to achieve the right representation in the digitization process, and lack of accessibility to cultural heritage assets. Therefore, this study examines the ethical dimensions to digital custodianship of African heritage. Employing a mixed research method, the study reviewed 10 digital heritage platforms across Africa to understand the technological, ethical, and operational challenges inherent in current digitization processes. The study assessed the role of modern technologies including 3D modeling, virtual reality, mobile applications and cloud-based systems in promoting ethical and inclusive digitization practices within a digital humanities' framework. Based on these insights, the study presents a comprehensive strategy for sustainable digitization, emphasizing community involvement, a more robust technological integration, and collaborative frameworks among multiple African stakeholders. Ultimately, the findings of the study support the development of an African unified, and decentralized digital platform to bridge the divide and facilitate inclusive global engagement with both tangible and intangible heritage, ensuring the preservation of cultural integrity, accurate representation, and broad accessibility.

Keywords: Digital transformation, Cultural heritage, Digital Custodianship, Decentralized Platform, African heritage, Ownership, Representation, and Accessibility.

Introduction

Documentation is the missing link between life and death of a culture, a culture dies when the last person talks about it. Documenting these cultures gives it a perpetual lifeline to live on through future generations. In recent times, the global upsurge in digital technology use has revolutionized how modern societies preserve and interact with cultural heritage (Wang, 2024). This shift has offered new ways to document, archive, and share cultural narratives worldwide. However, the discourse around digitization of African heritage presents unique challenges that extend far beyond technological adoption, as issues such as dispute in heritage ownership rights, difficulties to achieving culturally accurate representation, and limitations in accessibility of digital heritage platforms impede the full realization of various digital heritage projects across the continent. Hence, the African cultural heritage, with its profound historical, cultural, and educational significance, faces escalating pressures from modernization and globalization. These forces, compounded by the threats of time, neglect, and potential loss, underscore the urgent need for heritage preservation (UNESCO, 2021).

Indeed, the digital preservation of African history and culture is essential, but insufficiently handled despite its significant historical, cultural, and commercial value (Ramatlhakwana, 2009). Africa's cultural values and traditions are endangered by natural deterioration, theft, age long misrepresentation, and inaccessibility, aggravated by historical injustices such as colonial exploitation (Ezeadichie 2017; Abungu, 2016; Shaw, 1997). Whilst the concept of heritage digitization offers a progressive opportunity for the preservation and propagation of cultural heritage, existing digital heritage projects often showcase deficiencies in accessibility, accuracy in cultural representation, and clarity of ownership.

The digitization of these cultural heritage assets remains crucial as it helps contribute to their preservation and accessibility (Temudo, 2021). Digitization is vital since most modern-day consumers of cultural heritage are tech-savvy and living in the digitization age. The process of digitization enhances the appreciation and understanding of diversities of cultures in Africa, which can help demystify stereotypes associated with certain African ethnicities and cultures (Awoniyi, 2019). Yet, the digitization of African heritage also brings significant challenges most notably, concerns over ownership and intellectual property rights. The Sarr-Savoy Report in 2019 urged for nuanced strategies in digitizing African cultural heritage, emphasizing the importance of addressing intellectual property rights to ensure that digital representations do not exploit or misappropriate African cultures (Pavis & Wallace, 2019; Sarr and Savoy, 2018). It is worthy to mention that some previous digital initiatives aimed at preserving African heritage are fragmented, with disparate systems and methodologies. These hindered cohesive preservation efforts as ethical considerations ranging from the repatriation of cultural artifacts to ensuring that indigenous voices are accurately represented remain critical in the process. This research gap thus exists, due to lack of ethical management and community inclusivity frameworks on the digitization of African cultural heritage and legacy (Adane *et al*, 2019). The above complexities highlight the need for a robust ethical framework that can support a more sustainable digital heritage initiative.

Consequently, the study aims to investigate and understand ownership of African artifacts, cultural sites, traditional knowledge, and languages etc. to ensure accurate depictions of African cultural heritage and change old stereotypical narratives of Africans and African culture around the world. The specific objectives of this study are to: (1) evaluate selected case study digital heritage platform models across Africa to identify technological, ethical, and operational challenges in preserving cultural heritage, (2) highlight, the challenges of accessibility and disputed ownership rights in African heritage digitization, (3) propose a decentralized digital platform model that strongly unifies African cultural assets to achieve broader accessibility, more accurate representation and efficient ethical considerations in heritage preservation, and

(4) explore collaborative strategies involving local communities, cultural custodians, and international stakeholders to promote sustainable and ethical digitization practices that safeguard indigenous cultural narratives.

The study employs a multi-theoretical framework digital humanities theory, post-colonial theory and decentralized architecture theory to analyze these difficulties and suggest evidence-based remedies. The intention is to establish a framework for sustainable and equitable digitalization practices by emphasizing ownership, representation, and accessibility that will enable African communities to recover their cultural narratives and mitigate the digital divide. The model focuses on three main aspects, such as challenges on identification in the process of digitalization of African heritages, identifying the processing filters and proposing the solutions including institutional engagement, community involvement and adequate funding. The significance of this study lies in its emphasis on a unification framework that tackles challenges around ownership rights of cultural artifacts, their accurate depiction, and easy access as well as preservation using a digital technology.

Literature Review

Conceptual Framework

The conceptual framework examines the opportunities as well as some challenges with digitizing African cultural heritage, particularly in ensuring equal access, accurate representation, and respect for indigenous rights to ownership.

Ownership Rights

The subject of ownership rights remains one of the most complex and sensitive issues facing the digitization of African cultural heritage. It is a multifaceted issue that connects legal, ethical, and cultural factors. Most African cultural assets and behaviors are founded on indigenous knowledge and cultures, whose legal ownership is difficult to define. This raises issues about who retains the rights to digitize and disseminate such assets. Africa's colonial past further compounded the matter, since most of Africa's cultural heritage was looted during this period. When the ownership of these assets is being contested, it is difficult to know who has the legal authority to digitize them and make them available to the public (Awoniyi, 2019). Another challenge is that many of the cultural heritage assets are outside their countries of origin, having been acquired by colonialists during the colonial era from indigenous people. The ownership issues have resulted in misrepresentation. Thus, the representation of Africans and their history is inconsistent and more often than not fictional today particularly in the museums of the Western world and in the media. Most of the African relics and artefacts are exhibited without accurate cultural representations which in most cases are not a representation of African culture, but merely a western stereotype.

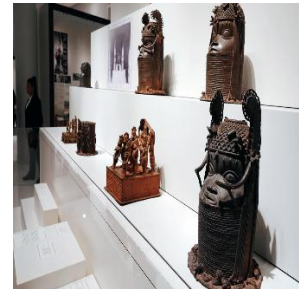
Statistics show that African cultural artifacts are misrepresented in 70% of museum exhibits worldwide (Cain, 2011). This misrepresentation not only distorts the public's understanding of African cultures but also marginalizes the voices of African communities, preventing them from narrating their own histories and cultural narratives. For example, in Nigeria, the ownership of cultural artifacts has been an ongoing issue. The case of the Benin Bronzes highlights the contentious issue of ownership of cultural artifacts in Nigeria. The Bronzes were acquired from the Kingdom of Benin, currently Edo State, include bronze memorial heads of kings and enemies, ritual objects, and carved ivory tusks (Dan, 2020). Apart from Benin Bronzes, there are various cultural heritage assets that were taken during the colonial period and are located in museums outside Nigeria. The Nigerian authorities and various other African civil organizations have been advocating for the return of these assets, but logistical and legal challenges regarding ownership persist. These challenges complicate the efforts to digitize these assets, given the questions about the legal owner of the digital rights and who should benefit from the digital reproductions (Gregg, 2022). Ownership issue also contributes to theft and illicit trade of African artifacts. The theft and illicit trade of African cultural artifacts is a critical issue, with over 90% of Africa's cultural heritage artifacts held outside the continent, primarily in Western museums (The Art Newspaper, 2019). This phenomenon is largely a legacy of colonial plunder. The illicit trade in African art is valued at over \$450 million annually, further depriving African nations of their cultural patrimony (Times Report, 2001). The looting of these artifacts not only stripped Africa of its cultural wealth but it also impeded on the ability of African societies to connect with their heritage.



1(a) We three kings, Arte Dahomey (BBC.com)



(b) African masquerades (Photo by: Kend Lund)



(c) Benin Bronzes (Anewz.tv)

Plate 1a - c: African artifacts in Western Museums, illustrating decolonial critiques of misrepresentation and decontextualization

Accurate Representation

The age-long cultural misrepresentation compounded by colonial disruption, has led to inaccurate perceptions of her art, history, and cultural achievements. Many African artefacts are held in Western museums and therefore separated from their origin and context. These items typically depicted as "exotic" or

"primitive," do not accurately reflect the sophistication of African civilizations, such as the empires like Songhai, Mali, Zulu, Oyo, Great Zimbabwe and Ethiopia, or the rich creative expressions found in the Ife, Benin and Nok cultures. Also, African ancestry is sometimes oversimplified into broad clichés that neglect the continent's tremendous cultural variety. Languages, cultures, and histories are reduced to a homogeneous identity that does not account for the distinctiveness of nearly 3,000 diverse ethnic groups spanning 54 nations. This lack of depth underscores the biased narrative and supporting prejudices rather than honoring Africa's genuine historical contributions to science, philosophy, art, and politics. Another challenge is how to achieve the right representation in the digitization process. One of the issues that are difficult to solve when creating a digital model is to ensure that the artifacts' context and cultural value are depicted correctly (Sökmen & Yüksek, 2016). When there is no context and when some of these assets are misinterpreted, the value of the digitized heritage is reduced and there are misunderstandings that may occur. It is also important to note that the process of digitization of cultural heritage assets is insufficiently supported by professionals and communities. The absence of funds and qualified personnel leads to the varying level of digitization completeness. Also, cultural heritage assets are associated with certain dialects, languages or cultural groups. However, in Africa, it is almost impossible to guarantee that digitized materials are easily understandable and translated in different languages (Temudo, 2021). Hence these cultural heritage assets need to be described in detail about the history and background of the particular asset. The question of representation is well illustrated in Egypt, which hosts some of the world's most iconic cultural assets, the pyramids. One of the challenges that are evident in the digitization of many of Egypt's heritage is that of representation. These heritages are in foreign museums and digitization is conducted with little involvement of Egyptologists and local historians who could give the most accurate history and background information of the heritage materials. Therefore, there is a distortion of the Egyptian cultural heritage that does not represent the cultural importance and the local context (Springer & Morris, 2019). The issue of representation also leads to bias in the priorities that are given to digitization. For instance, paintings found in the Sahara Desert are some of the oldest paintings in the world with more than 650 rock art sites and depict the events of the prehistoric period dating back to 7,000 BC in other words, more than 9,000 years old.

However, the process of digitizing these cultural assets is usually done in a selective manner and more so in those that are saleable like those that fit the mainstream narrative or those with aesthetic value on the face of it. The bias implies that there are many other cultural heritage assets which are not well known but are as valuable as the more famous ones and they are not represented in the digital domain (Lernia, 2017).

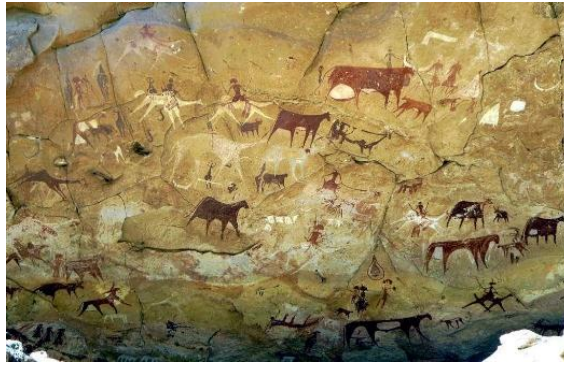


Plate 2: Manda Guéli Cave in the Ennedi Mountains, Northeastern Chad are some of the world oldest paintings spanning over 9,000-year-old.

Equitable Access

The lack of accessibility to African heritage whether due to physical, digital, or linguistic barriers poses a significant threat to the preservation of Africa's rich cultural legacy. The democratization of access to African cultural heritage is a central goal of digital initiatives. The Afro-Digital Museums network aims to democratize access to Afro-Brazilian cultural archives, emphasizing the need for inclusive strategies that consider the challenges of digital curation and access (Silva & Motta, 2024). The exportation of priceless and valued African artifacts to museums outside the continent, often gotten through theft and colonial exploitation, have often limited the access of these cultural items to African communities hindering efforts to preserve, study, and celebrate them in their original context. For instance, the Queen Idia pendant mask, which was a symbol of the Benin Kingdom's rich artistic tradition, is currently held at the British Museum (Wood, 2012). Another example, is the Royal Seat of the Kingdom of Dahomey, taken from the present-day Benin Republic (formerly known as Dahomey), is exhibited at the Quai Branly Museum in Paris (France 24, 2021). These are a few examples along with many others that underscore the broader issue of how African cultural artifacts have been dispersed in different museums of the world, often without the consent or recognition of the communities of their origin.

Addressing these challenges requires a multi-faceted approach that includes improving infrastructure, expanding digital preservation efforts, repatriating artifacts, and supporting cultural education initiatives. By making African heritage more accessible, we not only ensure its conservation but also empower African communities to reclaim their history, strengthen cultural identity, and share their stories with the world. Insufficient technical competencies, equipment, and connection to the Internet pose challenges towards the process of digitization (Sökmen & Yüksek, 2016), which is associated with quality technological resources like cameras and software. The process of digitization requires a lot of monetary investment. In Timbuktu, Mali there are thousands of ancient manuscripts that contain a wealth of information about the African

civilization, science and history. However, Mali faces financial challenges which hamper digitization and thus expose these manuscripts to deterioration and destruction (Sidi, 2012). However, it is important to mention that the digital formats need constant updates and revision in order to remain useful and accessible in the long run. Digital collections in African institutions are not properly preserved due to lack of skills and materials (Temudo, 2021). Lack of access also slows down the digitization process, as seen in the case of South Africa. While museums in South Africa have gone a long way in digitizing the country's cultural heritage assets, a major challenge is still observed in the area of accessibility. Even the collections that have been digitized are out of the reach of the local population due to poor and expensive internet connectivity. For example, although the cultural heritage assets in the Robben Island Museum and Apartheid Museum have been digitized, the public can only access them if they have access to the internet and other relevant technologies. Thus, many South Africans are indifferent to the process as they do not find any purpose of these digital archives (Shearing & Kempa, 2004). In Zimbabwe, Great Zimbabwe Ruins is a cultural asset that shows how the Zimbabweans lived in the past. Despite their historical significance, lack of resources in form of digital technologies has hampered the process of turning the ancient city into a digital city. Since the Zimbabwean government does not want to invest in digital equipment, it becomes challenging to develop digital records that can be made available to the public (The Collector, 2023).

Theoretical Framework

The theoretical framework of this study combines the Post-Colonial Theory, Theory of Digital Humanities and the Decentralized Architecture theory to help establish a solid base for the application of the digitization of African cultural heritage. The Post-Colonial Theory opposes the historical misappropriations of African culture, cultural artifacts and promotes self-representation and the decolonization of cultural narratives. Digital Humanities Theory, on the other hand, highlights the application of digital technological in creating accessible, accurate, and engaging representations of cultural materials. Complementing the two theories is the Decentralized Architecture Theory which supports models for developing a unified yet distributed digital platform that overcomes fragmentation by promoting interoperability, shared resources, and collaborative management across diverse heritage projects by advocating for inclusive platforms and multilingual content to bridge the digital divide. Collectively, these theories provide a thorough and culturally attuned approach for safeguarding African heritage in the digital era

Post-colonial Theory

The post-colonial theory developed in 1978 by Edward Said explores how historical impacts of colonization breed appropriation, misrepresentation, and marginalization of African cultural artefacts (Marschall, 2016). Some past

studies from (Diko, 2023) emphasized on the lasting repercussions of colonial exploitation, in which African artefacts were mostly looted and shipped to Western institutions, estranged from their origins and indigenous communities. Their work highlights the ethical necessity of restitution and the use of digitization as an instrument to prioritize preservation of heritage and uphold African voices and narratives. Discussions on restitution, especially with prominent cases such as the Benin Bronzes, exemplify how post-colonial theory shapes the ethical considerations of cultural heritage digitization (Oriakhogba, 2022). Therefore, this theory corresponds with the study's objective to help remedy historical distortion, misrepresentation of African cultural heritage and thus advocate for African-led digitization initiatives to ensure the true depiction and reclamation of cultural narratives.

Digital Humanities Theory

The theory of digital humanities developed in 1946 by Roberto Busa explores the application and intersection between cultural heritage and technology use. It examines ethical and inclusive dimensions to the preservation and publicity of cultural assets through digital pathway (Luhmann and Burghardt, 2022). The study by Muenster (2022) thus examined the transformative capabilities of technologies such as 3D modelling, virtual reality (VR), and augmented reality (AR) in producing precise and immersive depictions of cultural heritage. They advise against technical determinism, highlighting the necessity of prioritizing cultural and communal settings in digitization initiatives. Hamilton (2020) explains how digital humanities might democratize access to cultural information, especially for marginalized people. Moreover, Owens and Padilla (2021) in their study demonstrated how blockchain technology use can facilitate transparency and provenance in the digitization of cultural artefacts, thereby resolving ownership rights. This study advocates the ethical application of digital humanities theory to digitize African heritage, prioritizing accessibility, authenticity, and equitable representation.

Decentralized Architecture Theory

The Decentralized Architecture Theory was applied in this study to explore how African heritage digitization offers a framework for managing and preserving cultural heritage through the design and implementation of shared unified digital systems that promote interoperability, resource sharing, and community-driven governance model. According to Margaret (2025) decentralized systems foster resilience by dispersing control among multiple stakeholders rather than centralizing authority. This helps to mitigate the issues of fragmentation and data silos in digital heritage projects. Aldweesh (2023) further emphasizes that such architecture enhances adaptability and scalability, allowing for diverse cultural institutions and local communities to contribute directly to the curation and preservation of their heritage. Margaret (2025) highlights that decentralized digital platforms reduce the risks of data loss, censorship, and external control, making them particularly relevant for African

cultural heritage, which has historically been subject to colonial appropriation and external gate-keeping. Additionally, decentralized infrastructures enable participatory governance models where local communities, museums, and researchers collaboratively manage and authenticate digital artifacts (Usmaedi et al., 2024). This participatory community model ensures that the narratives surrounding African heritage remain accurate and reflective of indigenous perspectives rather than being shaped by external perspectives. Moreover, in recent times blockchain technology has emerged as a key enabler of decentralized cultural heritage management. Varadarajan *et al.*, 2025, argue that blockchain can provide transparent provenance tracking for digital artifacts, ensuring that ownership records remain immutable and verifiable. This is particularly crucial in addressing longstanding issues of contested ownership and cultural repatriation.

The application of Decentralized Architecture Theory provides a strategic solution to address issues of accessibility, representation, and long-term preservation. It aligns with the study's objective of developing a unified yet distributed platform that integrates emerging technologies such as blockchain, AI-driven metadata indexing, and community-managed archives to ensure that African heritage remains both protected and widely accessible.

Digitization of African Cultural Heritage

Digitizing African cultural heritage is simply the use of digital technology to convert cultural artifacts to digital formats to enhance preservation, accessibility, and accurately propagate the rich cultural traditions and knowledge of the continent. This process is crucial for safeguarding indigenous knowledge, promoting cultural diversity, and ensuring that future generations can engage with Africa's diverse heritage. Digitization plays a crucial role in preserving, disseminating, and promoting African cultural heritage. By converting physical materials into digital formats, digitization safeguards cultural assets from physical degradation, natural calamities, and human-induced harm. Additionally, digital formats enable broader accessibility, empowering researchers, educators, and the public to remotely access these materials. This enhanced accessibility fosters in-depth scholarly investigations, curriculum development, and educational resources, ultimately contributing to a deeper understanding and appreciation of African culture.

The 21st century saw the widespread adoption of digital technology, which has revolutionized the way people communicate and impart knowledge (Aziz & Pujowati, 2023). Emerging digital technologies such as artificial intelligence, virtual and augmented reality offer intelligent tools that can be leveraged to identify, share, and protect heritage, thereby rendering traditional methods of preservation obsolete. Thus, digital heritage is an emerging trend whereby unique cultural assets are produced and preserved. (Sökmen & Yükses, 2016). By digitizing Africa's abundant cultural legacy and making it accessible over the internet, it has the potential to attract visitors, stimulate the growth of

creative businesses, better educate the global audience on African rich misrepresented history and contribute to economies that rely on knowledge and information. Although digitization provides substantial advantages, it also poses notable difficulties. Significant financial resources are necessary to overcome technical challenges, including the acquisition of specialized equipment and knowledge. The intricacies of copyright and intellectual property matters may get convoluted, especially when addressing traditional knowledge and cultural manifestations. It is crucial to provide fair and equal access to digital resources for all Africans in order to prevent the worsening of current inequities. Moreover, it is imperative to meticulously address ethical concerns, such as the need to respect cultural sensitivity, engage with the community, and safeguard data privacy. Although there are difficulties, the potential for digitizing African cultural heritage is immense. Partnerships among governments, cultural organizations, and the commercial sector have the potential to expedite advancements. Investing in training and skills development is essential for cultivating a proficient workforce capable of executing digitization initiatives. Embracing new technology and creative techniques can boost the effect of digitalization initiatives. Hence, excellent storytelling using digital media may build compelling and more realistic narratives that connect with varied populations. Therefore, intentional effort must be made to help protect, foster, and make easily accessible Africa's rich history, arts, and traditions. There is need to convert these physical cultural artifacts, sites, documents, and oral traditions into virtual digital formats, to ensure the longevity of these invaluable resources while expanding their reach to a wider global audience.

African arts and cultures have been misrepresented, endangered and stolen, which has prevented African people from sharing their history as they wish. Such concerns question the ways the African' history is archived and made available, with digitization providing a viable solution. Furthermore, many artifacts within the African continent have continued to deteriorate due to inadequate preservation methods. This jeopardizes the survival of crucial aspects of African cultural identity and history. The above analysis shows that digitization brings a new thinking to address the challenges earlier identified. Thus, by using computers to create archives and museums, African cultural artifacts can be saved, exhibited to the world, and still remain a cultural possession. Digitization can promote genuine and appropriate portrayal since Africans can tell their own history. In addition, today's innovations including 3D modeling, Virtual Reality (VR), and Augmented Reality (AR) have been seen as useful tools in recreating lost artifacts or even stolen ones, hence increasing more people's consciousness regarding Africa's cultural assets. These technologies also entail educational aspects, which enable the global audience to gain knowledge concerning the cultures of Africa in an interactive manner.

Empirical Reviews

This review integrates findings from existing studies to explore themes of ownership, representation, and equitable access in the digital realm of African cultural artifacts. Past research studies have highlighted the complex nature of ownership dynamics surrounding African cultural artifacts, influenced by historical contexts of colonialism and urbanization. African cultural misrepresentation by western nations through colonial stereotypical notions has been a long-standing issue of critical concern. Mohamed Saliou Camara in his study argues that Africa's cultural diversity is often misrepresented due to ignorance and racism, and stresses the role of African media in reclaiming Africa's global image through corrective communication strategies (Camara, 2023). A study by Abungu (2016) discussed the challenges African nations face in repatriating and managing their cultural patrimony amidst international legal frameworks. International conventions aimed at curbing the illicit trade of cultural artifacts have not been entirely effective. Legal battles in foreign courts are also prohibitively expensive for African nations, making it difficult to reclaim their heritage (Roodt, 2002).

Furthermore, other empirical studies reveal the disparities in the representation of African heritage through a digitized database system. For example, the study by Camara (2023), which points out instances of misrepresentation and cultural appropriation, highlights the importance of adopting culturally sensitive practices in the digital realm. Over the last decade, advancements in technology, like 3D scanning and virtual reality, have opened up exciting possibilities for creating more accurate and immersive digital representations. Camara (2023), also examines the delicate balance between authenticity and commercial success in African storytelling, stressing the dangers of cultural appropriation and the necessity for collaborative efforts that include the cultures being represented in the creative process Camara (2023). Research underscores how digital platforms can help ensure equitable access to African heritage. Awori and Baguma (2022) advocate for design principles that are accessible and multilingual to expand global engagement while empowering local communities and advocates for sustainable development goals in digital heritage projects, including investment in infrastructure and capacity building. The study identifies common challenges such as technological barriers, funding constraints, and the protection of intellectual property rights. Some of the barriers faced by most African regions in realizing a cultural heritage digitization process, stem from inadequate technological infrastructure through insufficient internet connectivity, lack of digital equipment, and unreliable power supply, which are critical for sustaining digital projects. Nevertheless, opportunities lie in collaborative initiatives among African nations to partner and create a decentralized digital platform and innovative uses of technology to amplify African voices and narratives globally.

Research Method

This study adopts a mixed-method approach to examine the digitization of African cultural heritage, combining both systematic literature review with comparative case study methods. Using matrix analysis, data was systematically extracted and organized from over 100 sources from scholarly articles, project websites, institutional reports, and archival data on the subject matter, alongside an in-depth examination of 10 African digital heritage platforms. Our analysis captures key attributes such as technologies employed, preservation efforts, accessibility initiatives, ethical management strategies, and the challenges encountered, thereby revealing recurring patterns and critical obstacles in current digitization practices. Drawing on insights from Digital Humanities Theory, Post-Colonial Theory, and Decentralized Architecture Theory, the research advocates for developing a unified, decentralized digital platform for Africa. The unified heritage platform is thus designed to bridge the digital divide and empower local communities, ultimately ensuring the sustainable and inclusive preservation of African cultural heritage for future generations.

Analysis and Discussion

The analysis and discussion of this research involves a meticulous assessment of 10 existing African digital heritage platforms across the various African regions, encapsulated in the structured insights derived from the tables below. By drawing on theoretical framework of the Digital Humanities Theory, Post-Colonial Theory, and Decentralized Architecture Theory, the study was able to establish key opportunities and challenges in current African heritage digitization processes while laying the groundwork for a unified, decentralized digital platform tailored to safeguard and promote African cultural heritage inclusively and sustainably.

Table 1: Case Study of Contested Ownership and Accessibility of African Heritage

<i>Case Study</i>	<i>Ownership Rights</i>	<i>Representation</i>	<i>Accessibility</i>
Benin Bronzes (Nigeria)	Disputed ownership due to colonial acquisition; efforts for restitution ongoing (Gregg, 2022).	Often displayed in Western museums, misrepresenting African culture.	Limited access for the Nigerian society. But mostly accessible to global audiences.
Koitalel Arap Samoei Artifacts (Kenya)	Key artifacts, such as the Nandi leader's skull and regalia, remain held in private collections abroad (Bloomfield, 2008).	Representation lacks local narratives and cultural context, often disconnected from the Kenyan identity.	Limited local access due to foreign possession; poor infrastructure hampers digitization

			efforts within Kenya.
The Royal Seat of the Kingdom of Dahomey,	Majority held in foreign museums; repatriation efforts ongoing but challenges persist.	Indigenous narratives often overlooked from a Dahomeyan perspectives and significance	Access facilitated through international institutions yet remains limited for local communities of Benin Republic.
Egyptian Artifacts (Global)	Majority held in foreign museums; lack of repatriation agreements.	Misrepresentation common; narratives often exclude Egyptian perspectives.	Access is available through international institutions but disconnected from local communities.

Researchers Construct from a Systematic Analysis of Contested Ownership and Accessibility in African Cultural Heritage, using a Metrix Layout 2025

Table 1 offers an overview of the contentious issues surrounding ownership of African heritage artifacts, particularly between African nations and Western institutions. It points out the challenges related to ownership rights, the misrepresentation of African cultures in global contexts, and the limited accessibility of these artifacts to local communities. Despite the focus on contested artifacts held abroad, it is crucial to also consider the state of digital platforms for preserving African heritage within the continent. The analysis of 10 African digital platforms reveals diverse challenges and opportunities in their efforts to digitize and safeguard cultural artifacts. These platforms vary in their technological integration, preservation efforts, and accessibility initiatives, reflecting both progress and persistent challenges in the digitization landscape across Africa.

Table 2: Assessment of 10 African Digital Heritage Projects

Projects	Digital Technologies Leveraged	Preservation Efforts	Accessibility Initiatives	Ethical Management Strategies	Challenges Faced
1. Digital Benin Project	3D scanning, high-resolution photography Digital Benin (2025)	Digitizing artifacts and historical documents to create digital archives	Online databases and virtual exhibitions for global access	Focus on restitution, provenance research, and involving local stakeholders in	Disputed ownership issues, incomplete artifact records

				decision making	
2. Rock Art Digital Archive Project	3D modeling, VR simulations, GIS mapping Rock Art (2025)	Capturing high-resolution images and 3D models of rock art sites	Virtual tours and interactive maps accessible to both scholars and the public	Community consultation to respect local cultural significance	Environmental degradation and remote locations hindering access
3. Timbuktu Manuscripts Project	Digital imaging, metadata tagging, OCR (TMP,2025)	Digitizing rare manuscripts to preserve fragile texts	Digital libraries accessible worldwide; mobile access for local researchers	Collaborative efforts with local scholars to ensure proper contextual interpretation	Fragility of manuscripts, limited infrastructure in remote areas
4. Heritage Portal Egypt (2025)	Web-based platforms, digital curation tools	Creating digital catalogs of artifacts and historical sites	Multilingual online portals and virtual museum tours	Inclusion of local experts in content creation and narrative framing	Balancing commercial tourism with scholarly integrity
5. Museum Collection Digitization Kenya (2025)	High-resolution imaging, cloud storage, database management	Cataloging and digitizing artifacts from diverse ethnic groups	Open access repositories, community-driven storytelling initiatives	Engaging community voices for accurate representation	Variability in artifact documentation and funding constraints
6. Slave Wrecks Project (2025)	Underwater photogrammetry, 3D reconstruction, remote sensing	Documenting maritime archaeological sites to record historical narratives	Interactive maps and virtual dive experiences to reach global audiences	Collaborative research with descendant communities to contextualize the slave trade history	Logistical difficulties in underwater documentation and legal complexities
7. Berber (Amazigh) Digital Library	Digital archiving, multimedia digitization, standardized metadata El Kadoussi, et al., (2024)	Digitizing cultural texts, artifacts, and oral histories from Amazigh communities	Online library platforms with mobile accessibility and multilingual support	Engaging Amazigh communities to preserve authentic cultural narratives	Political sensitivities, language standardization issues
8. Nubian Heritage Digital Archive (NHDA)	High-resolution scanning, digital imaging, archival software	Digitizing Nubian manuscripts, artifacts, and architectural heritage	Digital libraries and interactive exhibits tailored to showcase Nubian heritage	Collaboration with Nubian scholars and community custodians to maintain cultural integrity	Preservation of delicate materials and balancing academic research with community rights
9. SAHRA Digital	Digital cataloging,	Comprehensive digitization	Publicly accessible	Institutional policies	Balancing comprehensive

Archives (South Africa)	database management, archival software (SAHRA, 2025).	of heritage resources, including archaeological sites and buildings	digital archives for researchers and the community	emphasizing ethical curation and collaborative content creation	ve digitization with resource limitations
10. Maasai Digital Heritage Initiative (MDHI, 2025)	Mobile data collection, digital photography, GIS mapping, VR storytelling	Documenting Maasai cultural practices, oral histories, and artifacts	Interactive digital platforms and community portals to share Maasai heritage	Involving Maasai community leaders in decision-making and cultural ownership	Inconsistent documentation and connectivity issues in remote areas

Researchers Construct from a Systematic Review on 10 Platforms on African Digital Heritage Initiatives, using a Metrix Layout 2025

Table 2 highlights ten diverse African digital heritage projects, each employing distinct digital technologies to preserve cultural artifacts and narratives. These projects range from digitizing manuscripts and archaeological sites to creating virtual museums and interactive platforms. Whilst each initiative aims to enhance accessibility and ensure ethical stewardship of cultural heritage, they face various challenges, including infrastructural limitations, ownership disputes, and the need for community engagement. The analysis underscores the complexities and innovations in digitization efforts across Africa, and shapes discourse on cultural preservation in the digital age.

Table 3: Identified Challenges in African Digital Heritage Projects

Challenge	Problem Description	Examples
Fragmentation & Disparate Systems	Independent projects use different data standards, metadata schemas, and technological frameworks, resulting in duplicated efforts and inconsistent records.	Digital Benin Project, SAHRA Digital Archives, Maasai Digital Heritage Initiative (varied platforms)
Ethical & Ownership Disputes	Disagreements over artifact ownership, provenance, and representation can lead to cultural misrepresentation and undermine community trust.	Digital Benin Project, Timbuktu Manuscripts Project, Nubian Heritage Digital Archive
Digital Divide & Infrastructure Limitations	Inadequate internet connectivity and limited local technological infrastructure hinder both local engagement and global accessibility.	Timbuktu Manuscripts Project, Maasai Digital Heritage Initiative, Ethnographic Museum Collection Digitization (Kenya)
Resource & Funding Constraints	High costs of advanced technologies (e.g., 3D modeling, drone photography) combined with inconsistent funding reduce the scope and longevity of digitization projects.	Projects across the board including Rock Art Digital Archive and smaller initiatives like the Berber Digital Library

Sustainability & Long-Term Preservation	Rapid technological changes and absence of continuous maintenance strategies challenge the ongoing viability and relevance of digital heritage archives.	SAHRA Digital Archives, Nubian Heritage Digital Archive, fragmented efforts across multiple independent initiatives
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Researchers Construct from a Systematic Review on 10 Platforms on African Digital Heritage Initiatives, 2025

Table 3 summarizes what we consider to be the five dominant issues about various African digital heritage projects. The projects Digital Benin and Maasai Digital Heritage Initiative demonstrate fragmentation and system silos which stems from inappropriate standard compliance and redundant attempt at duplication. Timbuktu Manuscripts Project is a case in point, where representation and ownership conflicts resulting in other ethical cultural issues concerning heritage and its custody arose. There are also infrastructural constraints like low bandwidth availability to internet, which is a direct constraint to other ethnographic museums digitization projects in Kenya. There are inadequate funds to provide for the sophisticated technologies and there are always the risks of not being able to sustainably maintain them later on, as with the SAHRA Digital Archives. These factors compound to show that there is very little, if any, efficient digital heritage preservation in Africa.

Table 4: Analysis of the Status, Focus & Accessibility of the 10 African Digital Heritage Projects

Project Name	Country's	Focus	Status	Website
Digital Benin Project	Nigeria	Digitizing looted Benin Bronzes for restitution and research	Active (launched 2022)	digitalbenin.org
Rock Art Digital Archive Project	South Africa	3D scanning and VR of San/Bushman rock art	Active (limited access)	rockart.wits.ac.za
Timbuktu Manuscripts Project	Mali	Preserving 30,000+ Islamic/ African manuscripts	Fragile (some copies exist)	tombouctoumanuscripts.uct.ac.za
Heritage Portal	Egypt	Virtual tours of pyramids and cultural sites	Active	egyptheritage.gov.eg
Museum Collection Digitization	Kenya	Digitizing artifacts from ethnic groups with community input	Active	museums.or.ke
Slave Wrecks Project	Multiple countries	Underwater archaeology of slave trade shipwrecks	Active (Smithsonian)	slavewrecksproject.org
SAHRA Digital Archives	South Africa	National heritage database	Functional but incomplete	sahra.org.za

Berber Digital Library	North Africa	Tamazight manuscripts and language preservation	Defunct (early 2010s)	Discontinued
Maasai Digital Heritage Initiative	Kenya/Tanzania	Oral histories and Maa language preservation	Inactive (ended ~2016)	None (check Maasai Association)
Nubian Heritage Digital Archive	Sudan/Egypt	Nubian languages and Christian texts	Defunct (early 2000s)	None (check Wayback Machine)

Researchers Construct from a Systematic Review on 10 Platforms on African Digital Heritage Initiatives, using a Metrix Layout 2025

The Table 4 above shows how Africa's digital heritage landscape is fragmented, with projects like Digital Benin active while others, such as the Berber Library, Maasai Initiative etc have collapsed overtime due to funding or maintenance issues. Accessibility varies, sustainability is weak, and reliance on foreign partners persists. This fragmentation necessitates the proposition for a decentralized platform, a unified system to preserve vulnerable heritage, ensure equitable access, and empower local communities through shared standards and distributed governance. Without it, Africa's digital cultural memory risks further disintegration.

Table 5: The Role of a Unified, Decentralized Digital Platform in Preserving African Cultural Heritage

Unified Digital Platform	Probable Solutions	Examples / Benefits
Standardization & Interoperability	Establish common metadata standards, documentation protocols, and ethical guidelines across all projects to ensure consistency and ease of data sharing.	Integrates diverse initiatives (e.g., Digital Benin Project, SAHRA Digital Archives, Berber Digital Library) into a cohesive whole.
Enhanced Ethical Management & Community Empowerment	Creates a structured framework enforcing ethical practices such as repatriation, cultural sensitivity, and active local community involvement in decision-making.	Models like the Digital Benin Project and Nubian Heritage Digital Archive can guide ethical repatriation and narrative framing.
Bridging the Digital Divide	Employ cloud-based and open-source technologies to deliver robust digital archives accessible even in regions with limited infrastructure, ensuring equitable global and local access.	Benefits projects like the Timbuktu Manuscripts Project and Maasai Digital Heritage Initiative by overcoming regional connectivity issues.
Resource Optimization & Sustainability	Pool financial and technical resources to reduce duplication of effort, enabling ongoing maintenance and updates across all digitization projects, thus ensuring long-term preservation.	Shared investment in technologies such as 3D modeling and VR benefits multiple projects, from Rock Art Digital Archive to SAHRA Digital Archives.

Global Engagement While Respecting Local Narratives	Foster a platform where global access to African heritage is balanced with preserving local cultural narratives, by incorporating both academic research and community-generated content.	A decentralized system can highlight voices from initiatives like the Berber Digital Library and MDHI, ensuring local authenticity.
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Source: *Researchers Construct from a Systematic Review on 10 Platforms on African Digital Heritage Initiatives, 2025*

Table 5 presents a proposed solution to Africa's digital heritage issues through a unified decentralized digital platform. It eliminates fragmentation by merging projects like Digital Benin and SAHRA under shared standards, while facilitating communities through ethical governance models as shown in the Nubian Archive. The unified system bridged infrastructure gaps with cloud access for at-risk projects (Timbuktu Manuscripts), is sustainable by using shared resources (3D/VR for Rock Art Archive), and balances global accessibility with local control (Berber Library). This new approach avoids further loss of culture and brings real African indigenous ownership of digital heritage preservation, otherwise, irreplaceable digital heritage is at permanent risk of being lost.

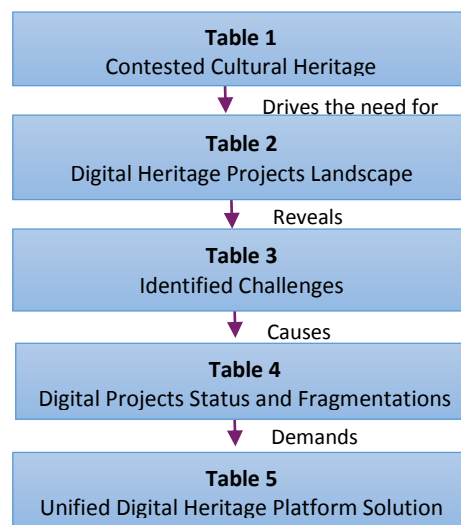


Figure 1: Illustrates Key Relationships Amongst Analytical Tables

The above figure 1 shows how contested heritage drives digitization, which reveals the systemic challenges, causing digital projects fragmentation that demands a unified digital heritage platform solution

Summary of the Results

This study brings to the fore the adversity faced by African heritage sites and their transformative potential for utilization and conservation across Africa.

Digital Renaissance of African Heritage

Table 1 revealed the systemic inequalities in artifact ownership, representation, and accessibility, with contested objects like the Benin Bronzes and Koitalel Arap Samoei artifacts being mostly inaccessible to their countries of origin. Table 2 documents trailblazing, but fragmented efforts from the Digital Benin Project's 3D restitutions to the Timbuktu Manuscripts' fragile digitization that document how infrastructure gaps, financial deficiencies, and ethical issues hinder progress. These obstacles intersect in Table 3, where fragmentation, disputed ownership, and technological asymmetries threaten sustainability, as seen in stalled projects like the Berber Digital Library. Table 4 shows the outcome of a fractured landscape whereby almost 50% of the projects surveyed fail because of varied standards or reliance on foreign partners. Yet, Table 5 lays out a plan for a pan-African decentralized platform that would bring projects under shared ethical and technical standards, enable communities through participatory governance, democratize access via low-bandwidth cloud technology for remote regions, and ensure longevity via shared resources and adaptive infrastructure. This integrated approach addresses Africa's digital heritage challenges with community ownership and sustainable preservation in mind. Without this intervention, Africa would risk losing irreplaceable cultural memory to fragmentation and technological obsolescence. The imagined platform is not merely technical, it is a decolonizing framework, reentering ownership, narrative authority, and sustainable access within African communities.

Figure 1 below illustrates a design of the proposed African Decentralized Digital Heritage Architecture that unites Digital Humanities' technicality, Postcolonial Theory's emancipatory critique, and Decentralized Architecture's distributed logic in order to form an anti-colonial scalable design for African heritage preservation through the digitalized platform.

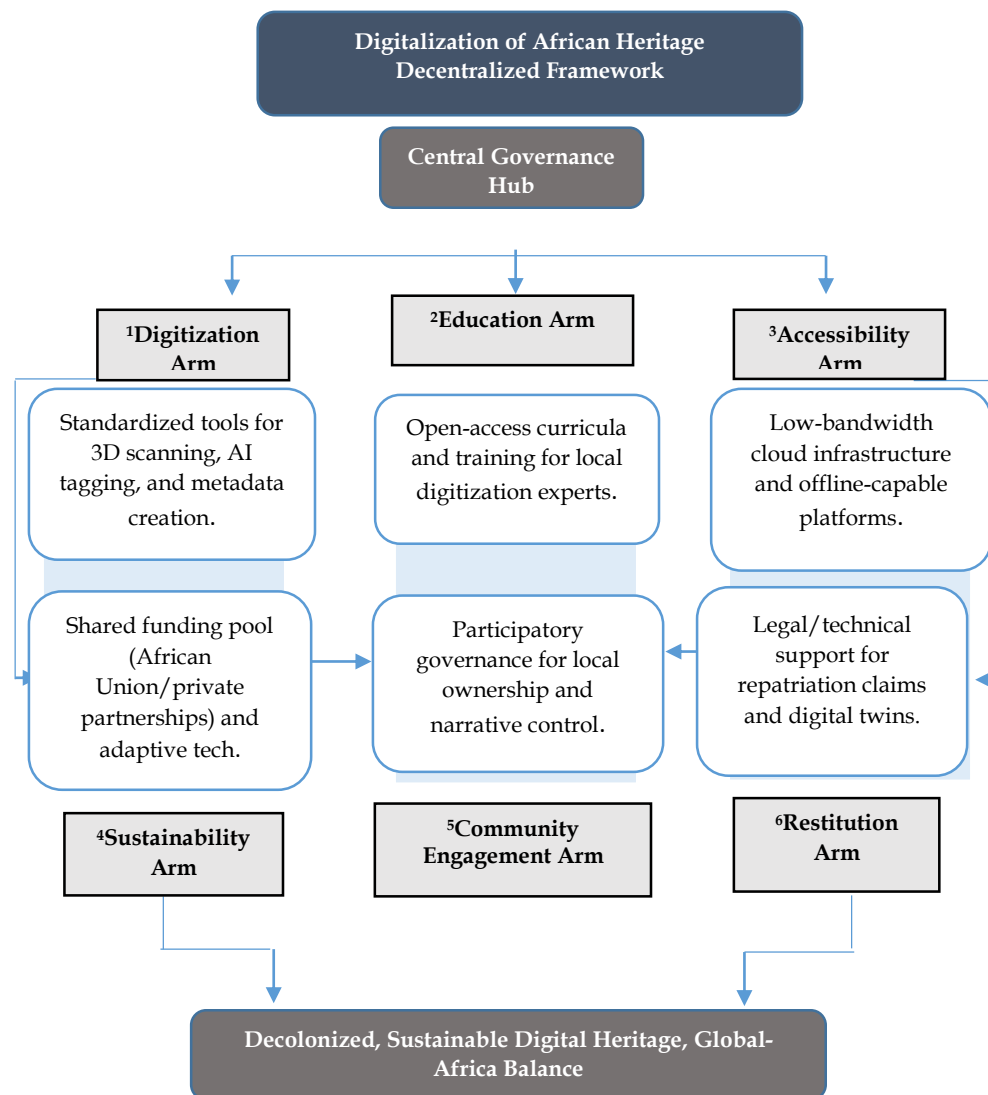


Figure 2: African Decentralized Digital Heritage Architecture

Conclusion

Having illuminated the intricate landscape of digitizing African cultural heritage, this study reveals both a promising advancement highlighting some persistent challenges faced across the continent. The findings support the development of an African unified, decentralized digital platform, designed to bridge the digital divide and facilitate inclusive global engagement with digitized African heritage backed by theoretical frameworks grounded in digital humanities, postcolonial, and decentralized architecture. By unifying

digitization efforts under shared ethical and technical standards, the framework ensures that ownership rights are respected, empowering communities to reclaim authority over their cultural narratives. With accurate representation, participatory governance is highly prioritized, and challenges issues such as historical misrepresentation by positioning African voices. Equal access is enhanced with low-bandwidth technologies, bridging the digital divide for local communities and global audiences. The unified framework does not merely preserve heritage, but also helps redefine preservation as a dynamic community-driven process that rectifies historical inequities while building a sustainable, and inclusive future. By combining the use of ethical governance, technical resilience, and decentralized collaboration, this research offers a blueprint for digital heritage preservation that is as culturally transformative as it is technologically robust. The collaboration of African governments through the African Union (AU) can help develop this unified heritage platform to foster a collective sense of responsibility and ownership for Africa's cultural legacy. This collaboration will further consolidate resources and knowledge, while ensuring that digitization initiatives conform to the cultural and ethical standards of African nations. Ultimately, these interrelated solutions offer a holistic, sustainable, and culturally attuned framework that can transform the digitalization of African history from a mere technological task to a significant instrument for cultural preservation and restoration.

References

- Abungu, G. (2016). Illicit Trafficking and Destruction of Cultural Property in Africa: A Continent at a Crossroads (pp. 240–254). *Palgrave Macmillan, London*
- Adane, A., Chekole, A. and Gedamu, G., (2019). Cultural heritage digitization: Challenges and opportunities. *International Journal of Computer Applications*, 178(33), pp.1-5.
- Aldweesh, A. (2023). Decentralized Framework for Cultural Heritage Conservation using Blockchain. 591-596.
<https://doi.org/10.1109/iccit58132.2023.10273979>
- Awoniyi, S. (2019). African Cultural Values: The Past, Present and Future. *Journal of Sustainable Development in Africa*, 17.
- Awori, K., Ssozi, F., & Baguma, R. (2022). Participatory Design: An East African Take. Participatory Design Conference.
<https://doi.org/10.1145/3537797.3537848>
- Anewz.tv. (2023). Netherlands return 119 colonial-era artefacts to Nigeria.
<https://anewz.tv/world/world-news/9442/netherlands-return-119-colonial-era-artefacts-to-nigeria/news>

- Aziz, A. M., & Pujowati, Y. (2023). Cultural Preservation in a Globalized World: Strategies for Sustaining Heritage. *West Science Social and Humanities Studies*, 1(3), 98-106.
- BBC News. (2018). The man returning looted artefacts to West Africa. Retrieved March 08, 2025, from <https://www.bbc.com/news/world-46324174>.am
- Bloomfield, S. (2008). Kenya tells museums: give our history back. Retrieved from <https://www.independent.co.uk/news/world/africa/kenya-tells-museums-give-our-history-back-883777.html>
- Cain, A. (2011). Representation of Africa and the African Diaspora in European Museums. *Human Architecture: Journal of the Sociology of Self-Knowledge*, 9(4), 9.
- Camara, M. S. (2023). African Cultures and Representations in the Digital Era (pp. 355-370). https://doi.org/10.1007/978-3-031-35060-3_16Cuno, J. (2012). *Whose Culture?: The Promise of Museums and the Debate over Antiquities*. Princeton University Press.
- Dan, H. (2020). *The Brutish Museums: The Benin Bronzes, Colonial Violence and Cultural Restitution*. Chicago: Pluto Press.
- Digital Benin (2025). Explore Digital Benin Retrieved January 08, 2025, from <https://digitalbenin.org/>
- Diko, M. (2023). The racial hierarchisation of the isiXhosa language in South Africa: A post-colonial discourse. *International Journal of Research in Business and Social Science* (2147-4478), 12(2), 598-607.
- El Kadoussi, A., Zaid, B., & Ibahrine, M. (2024, April 17). Amazigh Cultural Movement and Media in Morocco. *Oxford Research Encyclopaedia of Communication*. Retrieved 25 Mar. 2025, from <https://oxfordre.com/communication/view/10.1093/acrefore/9780190228613.001.0001/acrefore-9780190228613-e-1345>.
- Ezeadichie, U. E. (2023). Digital tourism and the development of Nigeria's cultural resources. *Journal of Tourism and Heritage Studies*, Vol. 12(2):
- France 24. (2021, October 26). *Paris's Quai Branly museum hosts final show in France for looted Benin treasures*. <https://www.france24.com/en/africa/20211026-paris-s-quai-branly-museum-hosts-final-show-in-france-for-looted-benin-treasures>

- Gregg, E. (2022). The story of Nigeria's stolen Benin Bronzes, and the London Museum returning them. Retrieved from <https://www.nationalgeographic.com/travel/article/nigeria-stolen-benin-bronzes-london-museum>.
- Hamilton, A. M. (2020). A genealogy of critical race and digital studies: *Past, present, and future*. *Sociology of Race and Ethnicity*, 6(3), 292-301.
- Heritage Portal Egypt (2025). Preserving Islamic World's Cultural Heritage for Future Generations Retrieved March 02, 2025, from <https://iwh.icesco.org/>
- Lernia, S. D. (2017). The Archaeology of Rock Art in Northern Africa. In B. David, & I. McNiven, *The Oxford Handbook of the Archaeology and Anthropology of Rock Art*. Oxford, UK: Oxford University Press.
- Luhman n, J., & Burghardt, M. (2022). Digital humanities – A discipline in its own right? An analysis of the role and position of digital humanities in the academic landscape. *Journal of the Association for Information Science and Technology*, 73(2), 148-171.
- Margaret John. (2025). From Data Silos to Decentralized Networks: Overcoming Data Fragmentation with Blockchain, Retrieved January 12, 2025, from <https://dev.to/margaretjohn/from-data-silos-to-decentralized-networks-overcoming-data-fragmentation-with-blockchain-1hp7/>
- Marschall, S., (2016). The heritage of post-colonial societies. In *The Routledge Research Companion to Heritage and Identity* (pp. 347-363). Routledge.
- MDHI (2025). Maasai to digitally record heritage for prosperity thanks to UN-backed scheme. *Maasai Digital Heritage Initiative*. Retrieved January 02, 2025, from <https://news.un.org/en/story/2009/08/308862/>
- Muenster, S. (2022). Digital 3D technologies for humanities research and education: an overview. *Applied Sciences*, 12(5), 2426.
- Museum Collection Digitization Kenya (2025). National Museums of Kenya, Digital Archive of Kenya's Ethnographic Collections. Archive Retrieved January 10, 2025, from <https://museums.or.ke/>
- Njeri Wangari. (2022). Africa's heritage restitution debate extends to audio and visual archives. *Global Voices*. *Photo source: Ken Lund*,

<https://globalvoices.org/2022/03/31/africas-heritage-restitution-debate-extends-to-audio-and-visual-archives/>

- Oriakhogba, D. (2022). *Repatriation of ancient Benin bronzes to Nigeria: reflection on copyright and related issues*. 17(10), 823–833. <https://doi.org/10.1093/jiplp/jpac089>
- Owens, T., & Padilla, T. (2021). Digital sources and digital archives: historical evidence in the digital age. *International Journal of Digital Humanities*, 1(3), 325-341.
- Pavis, M., & Wallace, A. (2019). Response to the 2018 Sarr-Savoy Report: Statement on Intellectual Property Rights and Open Access Relevant to the Digitization and Restitution of African Cultural Heritage and Associated Materials. Social Science Research Network. <https://doi.org/10.2139/SSRN.3378200>
- Ramatlhakwana, D., (2009). Challenges to digitizing the African heritage: some reflections. *ESARBICA Journal*, 28.
- Rock Art Digital Archive Project South Africa (2025). Rock Art Digital Archive Retrieved February 25, 2025, from https://www.bradshawfoundation.com/south_africa/arada_african_rock_art_digital_archive/index.php/
- Roodt, C. (2002). Cultural heritage jurisprudence and strategies for retention and recovery. *Comparative and International Law Journal of Southern Africa*, 35(2), 157–181.
- Sahra. (2025). Digital Documentation of South Africa's Cultural Heritage. South African Heritage Resources Agency Retrieved January 18, 2025, from <https://www.sahra.org.za/>
- Sarr, F., & Savoy, B. (2018). The Restitution of African Cultural Heritage: Toward a New Relational Ethics. Report for the President of France
- Shaw, T. (1997). The contemporary plundering of Africa's past. *African Archaeological Review*, 14(1), 1–7. <https://doi.org/10.1007/BF02968363>
- Shearing, C., & Kempa, M. (2004). A Museum of Hope: a Story of Robben Island. *The Annals of the American Academy of Political and Social Science*, 592(1), 62-78. doi:10.1177/0002716203261919.
- Sidi, A. O. (2012). Maintaining Timbuktu's unique tangible and intangible heritage. *International Journal of Heritage Studies*, 1-8.

Digital Renaissance of African Heritage

- Silva, C., & Motta, J. D. F. (2024). Irevir do Museu Afro Digital. *Equatorial*, 11(21), 1-30. <https://doi.org/10.21680/2446-5674.2024v11n21id38606>
- Slave Wrecks Project (2025). Slave Wrecks Project South Africa Retrieved January 22, 2025, from <https://slavewrecksproject.org/>
- Sökmen, S., & Yüksek, G. (2016). Digital Cultural Heritage: Some Critical Reflections. *TOLEHO*, 3(2), 138-145.
- Springer, L., & Morris, N. (2019). Art and Culture of Ancient Egypt. Rosen Central.
- Tamborrino, R., & Wendrich, W. (2017). Cultural heritage in context: the temples of Nubia, digital technologies and the future of conservation. *Journal of the Institute of Conservation*, 40(2), 168-182. <https://doi.org/10.1080/19455224.2017.1321562>
- Temudo, A. (2021). Current challenges for African cultural heritage: a case study of Guinea-Bissau. *MIDAS*, 18. doi:10.4000/midas.2909
- Times Magazine Report (2001). Looting Africa Theft, illicit sales, poverty and war are conspiring to rob a continent of its rich artistic heritage <https://time.com/archive/6678224/endangered-art/>
- The Art Newspaper. (2019). Many African Artefacts in European Museums Were Stolen. The Art Newspaper.
- The Collector. (2023). Great Zimbabwe: Centre of a Mysterious African Civilization. Retrieved from <https://www.thecollector.com/what-was-the-great-zimbabwe/>
- TMP (2025). Tombouctou Manuscripts Project, Retrieved February 13, 2025, from <https://tombouctoumanuscripts.uct.ac.za/>
- UNESCO. (2021). World Heritage List. UNESCO World Heritage Centre.
- Usmaedi, U., Lansiw, M. A., Studyanto, A. B., Gymnastiar, I. A., & Amin, F. M. R. (2024). Cultural heritage preservation through community engagement a new paradigm for social sustainability. *Deleted Journal*, 1(2), 50-59. <https://doi.org/10.54783/cv5q0011>
- Varadarajan, M. (2022). Repatriating Cultural Identity. *Museums, Transculturality, and the Nation-State: Case Studies from a Global Context*, 52, 87.

- Varadarajan, M. N., Rajkumar, N., Mohanraj, A., Delma, T., Mir, M. H., & Viji, C. (2024). Safeguarding Digital Archives with Advanced Strategies. *Advances in Knowledge Acquisition, Transfer and Management Book Series*, 279–310. <https://doi.org/10.4018/979-8-3693-9616-2.ch013>
- Wang, B. (2024). Applications of Human-Computer Interaction in the Field of Cultural Heritage Preservation. *Applied and Computational Engineering*, 105(1), 50–56. <https://doi.org/10.54254/2755-2721/105/2024tj0061>
- Wood, P. (2012). Display, Restitution and World Art History: The Case of the 'Benin Bronzes.' *Visual Culture in Britain*, 13(1), 115–137. <https://doi.org/10.1080/14714787.2012.641854>