

# Oman Memory and its Role in Preserving and Providing Access to Digital Heritage: The Current State and Future Prospects

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**ABSTRACT:** This study examines the objectives and scope of the Oman Memory digital initiative, focusing on the resources it preserves, its achievements, challenges, and future prospects. The Oman Digital Memory provides access to a unique collection of rare Omani manuscripts, documents, books, theses and photographs. More than 100,000 items have been digitized, with 40,000 additional copies added annually, reflecting the steady expansion of digital resources. The study offers empirical evidence of national heritage preservation and highlights trends that can inform policy and academic research. A qualitative methodology was employed, combining semi-structured interviews with officials and content analysis of publications, platforms, and documentation initiatives to identify strategic directions for preserving and making Omani heritage accessible to present and future generations. The study relied on a purposive sample of officials from the main units of the Oman Memory Center, ensuring representation of both strategic and operational perspectives at the departmental level. Data were collected through in-depth and semi-structured interviews and complemented by a review of official documents and internal records to enhance credibility. Thematic analysis of interview data revealed key themes and recurring patterns that complemented the content analysis. The study results showed that the Oman Memory Center provides essential activities and services to promote cultural identity by collecting, classifying, and making available documentary and intellectual production that reflects Oman's history and diversity. However, the Center faces challenges, including a lack of specialized personnel and the need to develop its digital infrastructure. To enhance the cultural and scientific role of the Oman Memory Center, the study recommends developing a national strategy for institutions concerned with promoting documentary and intellectual heritage, leveraging the contributions of each archive, library, and research center. It also recommends continuously engaging users to evaluate the effectiveness and impact of projects aimed at documenting, preserving, and making cultural heritage available. This study forms part of recent studies on digital heritage preservation in the Arab region.

**Keywords:** digital repositories, documentary heritage, documentation centers, oman memory, manuscripts.

## I. INTRODUCTION

Digital heritage includes all digitized or digitally created historical and cultural content, such as manuscripts, documents, audiovisual materials, and photographs. It plays a pivotal role in preserving and protecting knowledge, enabling electronic access and overcoming the geographical and temporal limitations of traditional documentary heritage (paper, parchment, etc.). Recent years have witnessed technological developments in digital preservation and providing access to heritage resources to a wide range of beneficiaries. These technologies include high-resolution digitization, optical character recognition (OCR), digital content management systems, metadata related to document organization and indexing, and cloud

storage solutions that support secure and efficient access. Recently, artificial intelligence has emerged as a tool for enhancing the preservation and accessibility of digital heritage, facilitating the analysis of texts and manuscripts, image classification, restoration of damaged digital content, and the creation of tools that enhance user interaction. Machine learning and deep learning technologies help support rapid access to and analysis of heritage sources, enhancing the role of digital heritage in protecting national identity at the cultural level and disseminating knowledge to current and future generations [1]. Oman's memory refers to the information and documented history of Oman, including a rich legacy of achievements in science, arts, culture, and traditions. This shared memory is preserved through the efforts of various cultural and educational institutions, including the National Records and Archives Authority, documentation centers, libraries, museums, and universities. One of the main institutions in this field is the Oman Memory Centre, which is of great importance in protecting this Omani heritage digitally, and contributes significantly to e-government initiatives [2].

Among the important heritage resources, the Omani manuscripts preserved at the Center stand out as a valuable part of the heritage created by Arab and Islamic civilization, to which scholars have dedicated their efforts to recording important knowledge and experiences. Accordingly, the Center, like other cultural and educational institutions around the world, seeks to recover, preserve, and make accessible what remains of this heritage, given its importance in supporting scientific research. Omani manuscripts also possess great historical and cultural value, as they contain Islamic knowledge and document Oman's history. The Center's heritage resources also include historical documents that cover important insights into aspects of Omani history and public and private life. In addition, documents and other heritage sources, such as maps and photographs, contribute to enhancing understanding of historical events, preserving national memory, and raising awareness of the importance of intellectual and documentary heritage. They also increase public awareness of the importance of public participation through local and national events [1].

Despite advances in technology for preserving and making digital heritage available, its preservation remains a major challenge due to technological obsolescence, material deterioration, and complex legal and ethical issues. Although numerous studies have been conducted on digital preservation strategies, the activities and services of the Oman Memory Center have not been thoroughly analyzed, particularly regarding how to keep pace with technological developments in preserving and providing long-term access to digital cultural resources, and the extent to which sustainable partnerships are built at the national and global levels to manage and maximize the benefits of digital heritage. Recognizing such challenges at the Omani level is essential to developing sustainable preservation strategies for Omani digital cultural heritage that are widely accepted and take into account internationally agreed-upon models of digital preservation and processing. Such as the Digital Processing Lifecycle Model [3], the Open Archival Information System (OAIS) Reference Model [4], and the Trusted Digital Repository Principles [5]. These frameworks provide a means of understanding and interpreting digital preservation processes (creation, preservation, storage, access, and reuse) at the Oman Memory Center within the broader scope of digital heritage preservation and access practices. This is consistent with what some recent studies, such as Shchepanskyi et al. [6], have emphasized, in combination with traditional and digital preservation methods in accordance with the capacity of institutions concerned with preserving and accessing heritage resources, the importance of staff training, and the implementation of user-centered digital access strategies.

The importance of this study lies in its ability to help monitor and find solutions to the problems of preserving and accessing heritage resources in one of the important institutions concerned with protecting and accessing national heritage resources, the Oman Memory Center, and its initiatives, challenges, and strategies in the field of preserving and accessing digital heritage resources.

## 1. STUDY OBJECTIVES

This study explores the core objectives of the Oman Memory initiative, the scope of its preserved resources, key accomplishments, challenges, and strategies for enhancing its services from the perspective of its administrators. To achieve these goals, the study addresses the following research questions:

- RQ1: What digital preservation and accessibility strategies has the Oman Memory Center implemented to safeguard Omani heritage?
- RQ2: What are the most significant achievements of the Oman Memory digital initiative?
- RQ3: What organizational, financial, and technical challenges does the Oman Memory Center face in implementing sustainable digital heritage preservation?
- RQ4: What future strategies could strengthen the Center's role in preserving and disseminating Omani cultural heritage?

## 2. METHODOLOGY

Given the research focus on institutional perceptions, experiences, and practices within a cultural context, a qualitative approach was adopted to enable the study to delve deeper into the nuanced complexities of heritage conservation practices and explore the implicit meanings associated with them [7; 8], which are difficult to accurately measure or interpret through traditional quantitative methods. This choice is more justified than a quantitative approach, as it allows for a greater depth and rigorous exploration of complex institutional perceptions, experiences, and practices. The study relied on a purposive sample of six officials from key units at the Oman Memory Center (OMC) to represent their perspectives at both the strategic and operational levels (Table 1). The interviews demonstrated a sufficient level of saturation across the main themes, coupled with the unique experience these participants have in managing the Center, making them a critical case study that contributes deeply to understanding the phenomenon under study. The units in the study sample include: the Information Resources and Documentation Department, the Oman Memory Museum, the Oman Memory Repository, the Omani Treasury, Information Systems, and the Center's Head. Data were collected through semi-structured interviews lasting approximately two hours. Interview analysis was complemented by a review of official documents and internal records to enhance credibility. The interviews helped explore multiple dimensions of the Oman Memory Center's practices, including the goals and functions of each of its units and their activities in preserving Omani memory; operational experiences and strategies for managing digital and physical resources; and the challenges they face, particularly regarding staffing standards, technology, budgets, and the strategies used to address them; as well as prospects for future development plans to improve access, enhance services provided to researchers and the public, promote digital sustainability, and expand the scope of resources.

The study adopted thematic analysis according to Brown et al. [7], which is one of the most widely used methods in qualitative research. Patterns and themes within the data were identified systematically through the stages of data identification, coding, theme development, analysis of implicit meanings in participants' experiences and linking them to the study objectives, and then preparation of the final report. To enhance the reliability of the study data, the researchers presented the results and their interpretations to the participants to ensure that they reflected their experiences. They also used document analysis to analyze the Center's strategy and data on its digital platforms. The study adhered to ethical standards by obtaining participants' consent after explaining the research objectives and participation procedures, ensuring the confidentiality of their identities and personal data, and allowing participants to withdraw from the study at any time.

**Table 1.** Interview participants.

Department	Role	Participant Code
Department of Omani Information Resources and Documents	Specialist	P1
Oman Memory Museum	Specialist	P2
Oman Memory Store	Specialist	P3
Omani Treasury	Head	P4
Information Systems	Specialist	P5
Head of the Center	Director	P6

### 3. DEFINITIONS OF KEY TERMS

- **Oman Memory**

The term “Oman Memory” refers to the “Oman Memory Project”, which aims to collect and document Omani heritage sources, digitize them, make them available to all, raise awareness of their value among the public, and preserve them for future generations. Operationally, this term encompasses the Center’s various activities and practices, such as digitization of documents and manuscripts; dissemination of content through electronic platforms; institutional collaboration; and organization of cultural and intellectual events supporting the safeguarding and accessibility of Oman’s national memory both locally and internationally.

- **Digital Documentary and Intellectual Heritage**

This term refers to all textual, audio, visual, and image-based materials that reflect Oman’s historical, cultural, and intellectual memory, which have been collected, produced, or converted into digital formats to ensure their preservation and accessibility through digital media. Operationally, it includes manuscripts, official documents, historical correspondence, rare books, scholarly outputs, and cultural content related to Oman, preserved or made accessible through digital platforms managed by the Oman Memory Center.

## II. LITERATURE REVIEW

Through a comprehensive search of online databases and electronic sources, the study identified several relevant works addressing the activities and services of institutions engaged in the documentation, preservation, and dissemination of heritage. However, only a limited number of these studies focused specifically on Oman Memory Center and the importance of preserving Oman’s cultural memory, as well as the potential role of heritage-related institutions at the national level.

- **The Activities of Information Institutions Dedicated to Heritage Preservation**

The UNESCO Recommendation [9] on the preservation of and access to documentary heritage, underscores the role of such heritage as a driving force for the knowledge society and as a safeguard of cultural and linguistic diversity. It stresses the importance of shared institutional responsibility in implementing international preservation standards to ensure the authenticity and reliability of documentary records, while also respecting cultural specificities. Consistent with these objectives, the recommendations are closely aligned with the UNESCO Memory of the World Programme, which seeks to raise awareness of the world’s documentary heritage and promote sustainable global access to it. Moreover, UNESCO emphasizes the importance of digital repositories in making information accessible and facilitating lifelong learning, thereby increasing the societal and educational significance of documentary heritage. In this regard, Samiei [10] highlights the importance of coordination and control of access to digital archives, arguing that cooperation between institution departments can significantly improve the effectiveness of preservation efforts. Some studies agree with this view, emphasizing the relationship between access to information, collective identity, and sustainable development [11]. However, challenges remain related to unequal access to digital infrastructure and the degree of alignment between international preservation standards and practices at the local cultural level.

Regarding the functions of digital repositories, Bautista-Puig et al. [12] and Al-Khatib [13] emphasize their importance in content management, providing open access to data, supporting decision-making, and achieving sustainable development through organizing and preserving digital resources for the long term. The results of their study highlight the importance of using advanced retrieval methods to access intellectual resources through structured systems that help digital repositories function as effective institutional memory systems. On the other hand, digital repositories not only enhance content, but also enhance the institution’s standing and the potential for collaboration between academic institutions at the national and international levels. In light of the operational and strategic benefits of digital repositories, Schaefer et al. [14] emphasize the need for standards-based evaluation to ensure that repositories successfully align with the goals of their respective institutions and the needs of their users.

In the Arab context, Alawi and Mahmoud [15] propose the creation of a central Arabic digital portal to simplify and enhance access to digital resources. They argued that cultural heritage institutions can only

succeed if they provide digital content from a consistent source, requiring a coherent and comprehensive online interface regardless of the diversity of platforms and sources. This theoretical vision is reflected in practical initiatives through the roles of digital repositories in protecting national cultural heritage [16; 17]. Their work focuses on mass digitization of rare manuscripts and documents, descriptive cataloging, restoration, and the conversion of intellectual and documentary production into digital formats, contributing directly to heritage protection and documentation for future generations [18].

In Oman, Al-Hinai and Al-Balushi [19] emphasized the importance of national heritage preservation programs, highlighting the Maqsurah platform, which collects and preserves Omani intellectual production while serving as a virtual platform for social participation. A design based on user needs and community engagement is critical to the continued success of digital heritage preservation initiatives. The Oman Memory Center is responsible for collecting, preserving, and making accessible documentary and intellectual resources related to Omani heritage. The Center's work includes documentation, indexing, and publishing, in addition to providing search services that facilitate quick and easy access to information. The Center also cooperates with institutions concerned with Omani heritage within the framework of its activities to collect and preserve digital heritage on an ongoing basis [20]. Some studies indicate the importance of private sector participation in preserving documentary heritage, and the adoption of strategies that take into account the technological, legal, and organizational aspects related to protecting and preserving national memory for future generations [21].

- Challenges Facing Heritage and Memory Institutions

Bjork et al. [4] attributed the efficiency of digital repositories to the metadata standards used and the speed with which users access information, as this is directly reflected in their level of trust in these repositories. Bogucki [22] pointed out the importance of having clear standards and policies in digital preservation projects for heritage resources to ensure the long-term sustainability of data, which contributes to improving the services provided. Ilik et al. [23] indicated that cloud storage technologies can enhance digital content management. Al-Saidi and Al-Maghrabi [24] pointed to the role of artificial intelligence technologies in improving data quality and retrieval methods, concluding that these technologies can enhance data quality in digital repositories and support decision-making in institutions. Digital preservation practices in institutions are influenced by the existing technical infrastructure and the extent of long-term adherence to standards. Institutions involved in preserving digital heritage face several challenges, including, as Alawi and Mahmoud [15] point out, the poor quality of digital content, restrictions related to commercial publishing practices, and the difficulty of organizing and retrieving heritage resources. Despite the importance of digital repositories for knowledge management and access, digital preservation projects face challenges such as limited budgets, a lack of trained personnel, and a lack of user engagement. These challenges can impact digital preservation initiatives and access to heritage resources.

In Oman, one digital preservation initiative is the Al-Maqsura platform, which was established as a digital repository. The platform faces challenges including the large volume of intellectual production published in Oman, which requires significant processing, digitization, and indexing, and the resistance of some individuals to the principle of making manuscripts publicly available [19]. There is also a need for trained personnel who can read and index manuscripts. A study by Awuor et al. [25] highlighted the challenges faced by cultural and heritage institutions, including difficulties in preserving, accessing, and organizing digital materials. Digital preservation initiatives and projects require the development of heritage resource preservation policies that take into account the financial, human, and technical challenges facing the institution.

Information institutions play an important role in addressing these challenges. To meet them effectively, they must adopt comprehensive digital preservation strategies that ensure the accessibility and usability of materials over time. Pandey and Kumar [26], in their study of the New York University Libraries, highlighted the necessity of designing policies responsive to technical developments, as well as societal and legal considerations, including documentation of marginalized groups' experiences. The integration of policy frameworks, technological solutions, and collaborative practices emerges as a central theme for effective heritage preservation globally and locally.

While the reviewed literature provides valuable insights into the roles, activities, and challenges of heritage preservation institutions both globally and regionally most studies have focused on general frameworks, international guidelines, or case studies conducted outside the Omani context. Therefore, an analysis of the activities of the Oman Memory Center not only bridges this gap but also provides a basis for evaluating best practices and long-term digital preservation strategies at the national level. This study addresses this gap by providing a comprehensive analysis of the Oman Memory Center's activities, evaluating the Center's strategies and initiatives, and its role in preserving Oman's documentary and intellectual heritage. It also identifies best practices and potential areas for improvement to enhance the Center's role as a national memory institution in line with global trends.

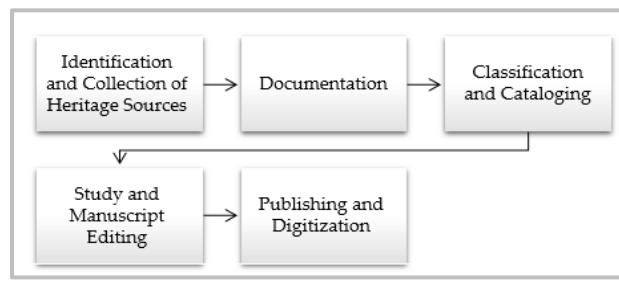
### III. RESULTS

#### 1. THE CURRENT ACTIVITIES OF OMAN MEMORY CENTER

##### 1.1 Core Operations and Digital Infrastructure

The Oman Memory Center (OMC) is equipped with a digital infrastructure. 66% of participants described it as comprehensive and enabling achieve its goals of preserving Omani documentary and intellectual heritage and making it accessible to all. This infrastructure is based on four main pillars (Figure 1): collection and documentation; preservation and indexing; heritage study and publishing; and digital and media services. The Center recognizes the importance of fieldwork to collect manuscripts, documents, and heritage sources, then digitally preserve them and facilitate public access to them via digital platforms. Therefore, these pillars constitute a well-thought-out strategy to enhance the efficiency of heritage preservation and reduce the loss of historical information, demonstrating the Center's commitment to heritage sustainability in a digital environment.

The Center operates with a broad vision to collect, document, and make accessible Omani documentary and intellectual heritage sources in sciences, literature, and arts. Its strategic mission is to support the Omani Renaissance project by preserving and facilitating access to intellectual and documentary heritage, enhancing the role of information institutions in disseminating knowledge, and facilitating researchers' access to documentary and cultural assets. The Center adopts a comprehensive approach to preserving manuscripts and heritage resources, providing access to them, and producing studies and research. In its strategy, the Center balances the goals of digitally preserving and providing access to heritage resources, and protecting heritage and generating knowledge by publishing studies and research on Omani manuscripts and documentary heritage resources. In light of this vision, the Center has developed innovative digital projects such as the Omani Library, *Diwan Al-Turath* (the Heritage Diwan) [27], and the Digital Memory of Oman, in addition to an advanced database containing manuscripts, documents, and rare books. This database, developed in partnership with technology companies, guarantees the privacy of Omani intellectual heritage and provides a unified indexing system that includes authors, copyists, and the locations of manuscripts and resources. The database also provides detailed indexing of manuscripts and heritage resources and features flexible search and retrieval capabilities, enhancing the value of written heritage and granting researchers precise access to heritage resources.



**FIGURE 1.** The core operational stages of the Oman memory center.

The Manuscript Cataloging Model developed by the Oman Memory Center provides a framework for cataloging Omani manuscripts and heritage resources. It includes lists covering cataloging data on authors, copyists, intellectual works, and locations of manuscript copies, in addition to general and specialized subject classifications. This system includes essential descriptive elements such as item number, uniform title, author data, scribe data, date and purpose of copying, name of the person for whom it was copied, content summary, opening and closing lines, physical description (condition, script type, colors, number of pages and lines per page), source information, remarks, and cataloger's details. Specialized databases for publications, institutional records, Omani documents, early printed works, and rare photographs are integrated into a unified bibliographic platform. "The Centre aims to organize content in structured collections and make it accessible to users," emphasized one of the participants, while another highlighted that "manuscripts and documents undergo a meticulous digital workflow starting with assessment and restoration, if necessary, followed by high-resolution scanning and cataloging, culminating in automated cataloging through Diwan Al-Turath [27]."

At the operational level, the Center conducts extensive fieldwork to collect manuscripts, documents, and heritage materials across all Omani governorates, prioritizing historically significant areas. The team also examines catalogs and digital registers in Arab, Islamic, and international libraries, and traces Omani scholarly and commercial travel to countries such as Egypt, Algeria, Tunisia, Libya, Zanzibar, Britain, and the Balkans. "Fieldwork in libraries and private collections across the Omani provinces has yielded a significant number of manuscripts, documents, rare publications, newspapers, and journals," stated 33% of the participants, highlighting proactive collection strategies. Restoration, cataloging, and conservation activities complement these efforts. "Given the significant delay and deficiencies in restoration and conservation work for manuscripts and documents in Oman despite the vast number preserved in private collections it became necessary to establish a specialized institution dedicated to the conservation of intellectual heritage materials," as affirmed by 33% of the participants. Since launching its dedicated digitization department in 2017, the Center has digitized tens of thousands of manuscripts, documents, rare publications, periodicals, and photographs, demonstrating a commitment to both preservation and accessibility.

### 1.2 Public Engagement and Cultural Outreach

The Center actively engages with the public and research communities through its museum, exhibitions, conferences, workshops, seminars, and training courses. It promotes cultural awareness, showcases selected heritage collections, and provides educational support for youth and researchers. "The Center's departments contribute to public engagement by raising awareness of Omani heritage, displaying selected collections in the museum, and supporting cultural education," explained one of the participants. Additionally, the Center uses social media platforms, websites, and digital projects to broaden its outreach, ensuring that both specialists and the general public have access to Omani heritage. This multi-faceted strategy connects heritage preservation with accessibility, fostering intergenerational understanding and deepening the sense of national identity.

### 1.3 Scholarly Research, Publications, and Digitization

In parallel with its preservation efforts, the Center engages in scholarly research, publishing, and media outreach. Specialized studies on Omani heritage, research on manuscripts, and printed publications are integrated with digitization processes. “This integration of digitization with scholarly production underscores the dual function of the Center: preserving heritage while simultaneously generating new knowledge about it,” highlighted one of the participants.

**Table 2.** Statistical indicators of documentary heritage and activities at Oman memory center.

Category	Number
Organization of international conferences	8
Production of documentary films	7
Manuscripts	21,000
Early printed works	193
University theses	660
Centre publications (studies and research)	166
Journals (Al-Zakherah Journal)	1

The digitization project has produced over 100,000 scanned items to date. Approximately 40,000 new scans are added annually, demonstrating the ongoing expansion of the Center’s digital resources. The Oman Digital Memory houses more than 21,000 manuscripts, along with a distinguished digital collection of Omani books, theses, documents, and rare images, reflecting the substantial volume of digitized material accessible to the public. This dual focus enhances the Center’s ability to support academic research and provides a comprehensive resource base for scholars, strengthening Oman’s role within regional and international academic networks. Table 2 summarizes the volume and types of digitized materials, while Figure 2 illustrates the digital search interface of the Oman Memory Center.



**FIGURE 2.** Digital search interface of the Oman memory center.

## 2. DIGITAL HERITAGE INFRASTRUCTURE AND STRATEGIC INTEGRATION

The Oman Memory Center (OMC) has implemented several landmark digital initiatives to safeguard and disseminate Omani heritage. The Omani Memory project serves as a comprehensive digital encyclopedia documenting events, phenomena, figures, periods, places, concepts, disciplines, and knowledge. Entries are organized alphabetically and thematically, ensuring both accessibility and breadth. Complementing this, the Oman in the Memory of the World project links Oman’s heritage to global knowledge networks, covering foreign manuscripts, official documents, press coverage, and travel literature. In 2022, the Center launched



Tarjuman Oman, a decade-long translation initiative to share Omani heritage texts globally, ensuring quality through rigorous evaluations and collaboration with subject-matter experts [2].

To facilitate preservation and access, the Center developed The Omani Treasury, an advanced digital platform that integrates MARC 21 bibliographic standards and Dublin Core-compliant metadata models. One respondent highlighted: "The Center aims to develop a unified platform that hosts a comprehensive bibliographic database of Omani intellectual output, organizing the content into curated collections and making them accessible to users". A central achievement is the collection and digitization of thousands of manuscripts from local and international collections, including private libraries. 50% of participants emphasized that "Fieldwork in libraries and private collections across the Omani provinces has yielded a significant number of manuscripts, documents, rare publications, newspapers, and journals. The rising public awareness in recent years has strengthened these documentation efforts, and in many cases, new collections are discovered during the digitization process".

The Center has digitized approximately 10,000 manuscript titles, including the earliest printed Omani book (1878 / 1295 AH) and 193 early publications (1878–1977). High-efficiency equipment ensures long-term preservation and accessibility. 33% of participants further noted that "Given the significant delay and deficiencies in restoration and conservation work for manuscripts and documents in Oman, it became necessary to establish a specialized institution dedicated to the conservation of intellectual heritage materials". Through these initiatives and digital projects, the Center demonstrates a comprehensive, integrated strategy combining digital preservation of Omani heritage, scholarly knowledge generation, and public engagement. By bridging national and international dimensions and integrating traditional archival work with digital innovation and outreach, the Center ensures that Oman's heritage is preserved, studied, and shared effectively.

### 3. KNOWLEDGE DISSEMINATION, SCHOLARLY AND PUBLIC ENGAGEMENT

Omani manuscripts hold great historical and cultural value, as they contain Islamic knowledge and records of Oman's history. Preserving these manuscripts contributes to safeguarding this rich heritage and documenting it for future generations [1]. The Oman Memory Center's collection also includes documents that provide important insights into various aspects of national history and both public and private life. Furthermore, documents, maps, and photographs help deepen understanding of historical events, preserve national memory, highlight the importance of documentary heritage, and promote public engagement through local and national events [28]. The OMC actively disseminates knowledge through 166 publications, covering diverse aspects of Omani heritage [2]. One respondent emphasized: "These conferences have attracted a wide spectrum of international scholars, creating platforms for dialogue and comparative perspectives on Omani heritage".

The Center has organized seven international conferences in Malaysia and participated in numerous forums locally and internationally, presenting approximately 225 research papers by over 255 researchers (Table 3). Its digital repository provides access to printed and digital editions, subscriptions, and interactive features, integrating heritage preservation with sustainable dissemination. This combination of publishing, conferences, and digital platforms positions the Center as both a generator of heritage knowledge and a facilitator of scholarly exchange, situating Oman within broader academic and cultural networks.

In the realm of cultural outreach, media, and public engagement, the Center produces documentary films such as:

- The People of Oman in the Service of the Holy Quran;
- Omani–Malaysian Relations;
- Five Years of Scientific Cooperation with Malaysia;
- Translating Omani Heritage;
- Oman Memory Center at the International Islamic University Malaysia.

These productions serve as tools of cultural diplomacy, translating heritage narratives into visual formats that engage both local and international audiences. 66% of participants highlighted: "Other departments contribute to public engagement by promoting awareness of Omani heritage, showcasing selected items in

the museum, and supporting cultural education". Additionally, the Center uses social media platforms, websites, and digital projects to broaden its outreach, linking preservation with intergenerational learning, public participation, and the reinforcement of national identity [2].

**Table 3:** International conferences organized by Oman memory center.

Conference Title	Year
Omani Role in the Unity of the Nation	2014
Omani Role in Supporting the Arabic Language	2015
Omani Relations with Southeast Asia, China, and Japan	2016
The Civilizational Mission of Omani Literature	2017
The Omani Printing Movement and its Role in Cultural Exchange	2018
The Omani Contribution to the Quran and its Sciences	2019
Translating Omani Heritage: Visions and Prospects	2022

#### 4. CHALLENGES FACING OMAN'S DIGITAL MEMORY

Regarding the challenges shaping the Centre's strategic directions and projects, one recurring theme is the difficulty of accessing privately held manuscripts. Approximately 33% of participants observed that "the lack of qualified staff capable of persuading manuscript owners to collaborate with the Centre often hinders collection efforts." This challenge is further exacerbated by limited public awareness of the importance of documentary heritage and the Centre's mission in preserving national memory. The challenge here is not confined to human resources; it reflects broader financial and logistical constraints that hinder effective fieldwork and outreach, thus affecting the Centre's ability to secure and document vital heritage materials.

Financial challenges significantly hinder the Center's activities. One of the participants noted that "budget constraints limit the Center's museum's ability to develop its infrastructure, such as installing interactive displays or providing protective boxes for artifacts, especially during transportation." This challenge not only impacts the visitor experience but also the Center's ability to showcase Omani heritage according to internationally agreed museum standards. This situation demonstrates how limited financial resources lead to the loss of numerous opportunities for cultural participation in events at the national and international levels.

Regarding the translation of studies, research, and evidence related to Omani heritage, particularly manuscripts and documents, while the Center is committed to transferring heritage sources and published studies on them globally, the scarcity and fragmentation of translated works remain a major challenge. Literary works are more often translated than scientific, historical, and artistic texts, which reduces the level of cultural representation of these works in translation activities. Furthermore, some translations fail to accurately reflect the linguistic and historical nuances of Oman, diminishing their cultural impact abroad. This means that the translation challenge for officials at the Oman Memory Center is both quantitative and qualitative, requiring coordination to ensure accuracy in selecting translated works based on their importance and impact.

Regarding efforts to catalog Omani heritage resources, cataloging represents a challenge for officials at the Center. One respondent noted that "there are an estimated 50,000 manuscript titles, yet only about 4% (approximately 2,000 titles) have been officially cataloged." The lack of cataloging of Omani heritage manuscripts (only about 4% are officially cataloged) reflects the significant challenges facing the Center, primarily due to the large volume and abundance of resources, the lack of qualified personnel, and limited budgets. Despite a sound technical infrastructure, the cataloging process remains time-consuming and requires coordinated strategies to enhance the comprehensive documentation of Omani heritage. This gap significantly reduces the possibility of discovering and scientifically utilizing Omani manuscripts, especially given the lack of standardized cataloging of manuscripts and heritage resources. Therefore, the Center has moved toward developing standardized catalog cards that enable accurate cataloging and recording precise descriptions that reflect the unique characteristics of Omani manuscripts. This initiative, represented by the

newly developed cataloging model, represents a valuable initiative by the Center to transition from the random collection and cataloging of manuscripts and documents without a unified cataloging framework, to a unified systematic model that meets the needs of catalogers when cataloging heritage resources.

Regarding digitization efforts, participants emphasized the Center's adaptability in embracing technological changes in its activities and practices and ensuring sustainable digital access to heritage resources. On the other hand, one respondent noted that "the digitization of intellectual heritage still faces significant technical challenges. For example, the lack of applications that enable the accurate reading and conversion of manuscripts, particularly Arabic ones, into text poses significant challenges, as some characters appear as random and incomprehensible glyphs." Furthermore, the inconsistent use of digital formats and metadata standards may limit the smooth interoperability and long-term integration of digital transformation projects.

The Center's challenges can be summarized in several aspects related to limited experience in raising awareness of the Center, its efforts, effectiveness, and programs; weak public engagement in documentary heritage initiatives; weak budgets and financial resources; insufficient coverage and poor quality of translated works; and a significant gap in manuscript cataloging, despite the progress made in digitization. The interconnectedness of these issues increases the pressures facing the Center in building its internal capacities and adhering to international standards for heritage preservation and dissemination.

##### 5. EXPLORING FUTURE DIRECTIONS FOR STRENGTHENING OMAN'S DIGITAL MEMORY

The future directions identified by the Oman Memory Center extend beyond the expansion of the digital archive to include the prioritization of digitizing rare Arabic manuscripts from private collections and underrepresented sources over the next three years. The Center also plans to enhance its digital platforms by developing personalized educational tools for university students and heritage researchers. In parallel, its strategy aims to expand manuscript digitization initiatives to preserve materials and improve accessibility through the adoption of standardized metadata models such as Dublin Core, thereby ensuring international compatibility. Alongside these efforts, the Center will invest in capacity-building programs to train at least 20 specialists in manuscript restoration and digital preservation by 2026. These practical steps represent a tangible roadmap that aligns the Center's vision with the operational requirements of sustainable preservation and access.

Moreover, 50% of participants indicated that "the substantial increase in the number of scanned images from 40,000 to more than 100,000 annually does not merely reflect a technological upgrade but also demonstrates advanced institutional capacity that enables the Center to carry out digitization both consistently and at scale." From a research perspective, this trend suggests that investment in workforce diversification and technical skill development is a critical factor in strengthening institutional capacity, linking human and technological resources to ensure the continuity of digital performance.

The digital infrastructure reflects a high level of strategic planning aimed at protecting documentary heritage and enabling researchers and the public to access digital resources in a systematic and scientific manner [24]. The strategy emphasizes the importance of expanding access through electronic platforms, interactive devices, and field documentation of manuscripts and rare heritage sources on site. As one respondent noted, "the Center's strategy balances heritage preservation with expanding public access to cultural resources." Therefore, 33% of participants noted that "the Oman Memory Center Museum complements the expansion of access to digital heritage by integrating initiatives with national institutions (such as the Oman Through the Ages Museum and the National Museum), with a particular focus on interactive displays and joint cultural events." This approach represents an integrated strategy that integrates Omani heritage with academic research and public culture, positioning the Center not only as a custodian of memory but also as a cultural actor actively involved in heritage education and awareness.

#### IV. DISCUSSION

In light of the study's objectives, which seek to evaluate the Oman Memory Center's experience in preserving and providing access to documentary and intellectual heritage, this discussion is interpreted in accordance with relevant literature. The Center stands out as a national digital initiative in the field of digital preservation, reflecting a strong commitment to protecting Omani cultural memory. For the purposes of analysis, three aspects are focused on: preservation, accessibility, and cooperation, given their importance in preserving and making heritage resources available, while cooperation provides opportunities to address and overcome financial and technical difficulties. This is consistent with what Samiei [10] stated regarding the importance of effective digital preservation, which requires an integrated framework that includes collection, cataloging, and accessibility processes.

Regarding preservation, the Oman Memory Center has adopted an integrated approach that includes collecting, documenting, restoring, digitizing, and cataloging documentary heritage sources. The Center's efforts in Omani governorates and its survey research in Arab, Islamic, and international libraries have yielded manuscripts, documents, and other heritage sources related to Oman. The Oman Memory Center's internal records confirm the processing of tens of thousands of manuscripts, documents, and heritage sources since 2017. The Center applies advanced cataloging standards such as MARC 21 and Dublin Core to enhance their retrieval and discoverability by researchers and ensure their long-term integrity. The Center has also introduced a detailed cataloging model that meets the requirements for cataloging manuscripts and is compatible with the OAIS reference model [20]. Through restoration and conservation of manuscripts and documents, the Center focuses on both traditional preservation of original manuscripts and digital preservation. According to Shchepanskyi et al. [6], hybrid models that integrate traditional and digital preservation are the most effective for protecting cultural and religious heritage.

However, challenges remain, particularly the reluctance of private sector owners to share manuscripts. The reluctance of some manuscript and document owners to share their manuscripts can be explained by the fact that they are part of their family identity or social symbolism, which makes some individuals reluctant to hand them over to official institutions for fear of losing control or misuse. The lack of clear regulatory frameworks that guarantee intellectual property rights and preserve the attribution of content to its original owners also contributes to this challenge, in addition to the lack of material or moral incentives provided to manuscript and document owners. Furthermore, the lack of specific incentives for participation may reduce the motivation to cooperate. Therefore, what Al-Hinai and Al-Balushi (2015) and UNESCO [19; 9] have indicated regarding the importance of building trust and establishing incentive mechanisms is a prerequisite for strengthening partnerships between public institutions and the private sector in the field of heritage preservation. Furthermore, only 4% of Oman's estimated 50,000 manuscripts have been cataloged, underscoring the need for extensive training and standardization of work procedures to avoid the risk of loss or misinterpretation of this intellectual and documentary heritage.

Regarding access to heritage resources, the Oman Memory Center has successfully transformed its holdings into digital content through platforms such as Diwan Al-Turath search engine [27] and the Omani Treasury. These platforms integrate bibliographic standards and user requirements, in line with UNESCO's Memory of the World Programme [9]. The Center's initiatives and 166 publications, such as Oman in Memory of the World and Tarjuman Oman, highlight the Center's role as a publisher of heritage and a supporter of scholarly exchange [20]. About 66% of interviewees agreed that manuscripts, documents, and other heritage resources undergo several technical processes, including collection, evaluation, restoration, high-resolution scanning, and automated cataloging, ensuring increased accessibility. These processes are in line with international standards [29]; Shchepanskyi et al. [6]; Zhong et al. [30] emphasize the centrality of public access to heritage resources not only as a result of technical developments, but as a cultural and educational necessity to enhance awareness of history and heritage among the public.

Although digitization was noted as facing "no major issues," participants revealed that the priorities of different departments within the Oman Memory Center varied. Museum staff focused on the visitor experience and the cultural sensitivity of the exhibits, while IT specialists emphasized data security and metadata integrity. Digitization experts prioritized workflow efficiency and accuracy, while documentation

specialists focused on provenance tracking and adherence to archival frameworks. These differences reflect the multifaceted nature of the Center's operations and the need for cross-departmental coordination to achieve institutional goals, in line with Samie's [10] observation on the importance of a coordinated workflow for effective preservation. Accordingly, the impression that "there are no major issues" can be interpreted as a perception gap between departments, with some departments seeing digitization proceeding smoothly within their scope of responsibility, while the institution faces broader challenges related to funding, staffing, infrastructure, and technical obsolescence.

At the level of global collaboration, the OMC aligns its practices with UNESCO guidelines and actively engages in regional and international initiatives, consolidating its role as both a custodian of national heritage and a participant in global heritage discourse. Its participation in international conferences and forums has reinforced its position as a regional leader, stated Ahmad & Sharma [18], who note that international partnerships enhance institutional capacity and sustainability. Comparisons with regional initiatives such as the Qatar Digital Library [31] and Digital Bahrain [32] reveal shared challenges limited sustainable funding, reliance on private manuscripts, and the need for professional training but also highlight OMC's distinctive three-dimensional framework, which combines local safeguarding with international engagement.

One of the most significant challenges facing the Oman Memory Center is sustainability. Financial constraints, stated by 33% of participants and confirmed by budget records, limit the Center's ability to expand its fieldwork to collect manuscripts and heritage resources and improve the Center's exhibition infrastructure. Translation also remains a challenge in the absence of a national policy, leading to inconsistencies in conveying Omani linguistic and cultural nuances [26]. The Center also relies on a funding model that includes endowment contributions (the endowment share), revenues from books and cultural products, and international partnerships, reflecting a practical strategy for financial sustainability. Funding impacts the Center's activities. While digitization is viewed as an important tool for preserving and making heritage accessible, its viability depends on stable resources and continuous staff development. Ahmad et al. [33] affirm that financial constraints and the lack of trained human resources represent the biggest obstacles to long-term digital preservation projects. To address this challenge, an effective methodology must be adopted, using performance indicators to assess the impact of the Oman Memory Center and its activities for both the academic community and the public, as Schaefer et al. state [14]. The study's findings indicate that the Oman Memory Center is not just a repository, but rather a heritage resource institution that aims to achieve a balance between preserving heritage resources and increasing access to them to maximize their benefits. This demonstrates that sustainable digital heritage resource management requires not only a technological infrastructure, but also stable financial support, comprehensive heritage resource management policies, and cooperation with institutions concerned with documentary and intellectual heritage resources at the national and international levels.

Building on the study's findings, which highlight the Oman Memory Center's notable achievements in preserving and providing access to Oman's cultural heritage through advanced digital platforms, the following recommendations are proposed to further strengthen its role, address identified challenges, and ensure long-term sustainability:

- Develop a national strategy to coordinate the efforts of Oman Memory with other cultural institutions, such as archives, libraries, and research centers, for integrated digital documentation and heritage preservation.
- Develop and maintain an advanced national digital platform for Omani cultural heritage, equipped with smart search tools and analytical technologies to enhance data linkage and improve content quality.
- Integrate artificial intelligence into digitization and cataloguing processes through specialized OCR software, advanced manuscript analysis, pattern recognition, and content enhancement techniques.
- Strengthen partnerships with academic and cultural organizations to exchange technical expertise and co-create sustainable digitization and preservation solutions.
- Provide sustainable training programs for technical personnel in areas such as organizing, preserving, and making available heritage resources (e.g., digital cataloging, manuscript preservation, metadata management) in line with international standards.

- Enhance cooperation between the Oman Memory Centre and institutions concerned with documentary and intellectual heritage, such as the National Records and Archives Authority, to exchange knowledge and benefit from best practices and knowledge exchange.
- Implement programs to raise awareness of the importance of Omani documentary heritage.
- Establish regular assessment mechanisms such as performance indicators or a framework to evaluate the Oman Memory Center's programs and their impact on beneficiaries and heritage preservation.

## V. CONCLUSION

This study focused on the importance of a strategy for preserving and providing access to digital heritage by analyzing the practices and activities of the Oman Memory Center, its achievements and challenges, and its role in heritage initiatives and projects. The results demonstrated the importance of balancing the roles of institutions concerned with heritage and national memory and applying international standards. The Center provides a model for collecting, organizing, cataloging, and making heritage resources available, which can be useful to other entities facing similar challenges. In light of the study's findings, the researchers recommend that national policies focus on standardizing cataloging processes, encouraging the exchange of manuscript collections, and adopting guidelines that take cultural aspects into account in the translation process. They also recommend establishing digital platforms that provide access to Arabic and Islamic manuscripts and strengthening international partnerships as a strategy to improve heritage management. Further research and expanding the scope of international cooperation are also considered to develop digital heritage management and maximize its benefits.

This study focused on the views of officials at the Oman Memory Center, and the findings were based on their opinions. Therefore, future research should include comparative studies that include a broader group of stakeholders involved in preserving and accessing Omani heritage resources, such as owners of private manuscripts, end-users, and international collaborators, to ensure a more comprehensive assessment of the cultural and educational impact of information institutions concerned with heritage resources.

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### Author Contributions

The first author conceptualized the study, developed its framework, reviewed and analyzed the collected data, drafted the manuscript, and implemented the revisions suggested by the reviewers. The second and third authors contributed equally by reviewing the research proposal draft and the final study, and supporting literature review throughout the study. The fourth author participated in developing the data collection tool, contributed to manuscript editing, and implemented the revisions suggested by the reviewers.

### Data Availability Statement

The data supporting the findings of this study are available from the authors upon request.

### Conflicts of Interest

The authors declare no conflicts of interest.

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