A Study of Digital Preservation of Manuscript Libraries and Archives in Thiruvananthapuram

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Abstract

Purpose: The main purpose of the study was envisioned to investigate the digital preservation status of manuscript libraries and archives of Thiruvananthapuram.

Methodology: The study employs the Survey method, A questionnaire was used to data collection.

Findings: The study reveals that Inadequate infrastructure, administrative barriers, and Lack of initiative from authority are the major barriers to digitization. The study suggested that the webpage or website of the library should have all the information about manuscripts to guide the users.



Originality/ Value: The study examines the several facets of manuscript collections housed at Thiruvananthapuram's archives and libraries. It was clear from the analysis of several goals that a variety of factors impact the handling, conservation, and distribution of these priceless cultural artefacts.

Keywords: *Archives, Deterioration, Digital Preservation, Digitization Barriers, Manuscript Libraries*

1. Introduction

A manuscript is a handwritten writing with substantial scientific, historical, or aesthetic significance that has been preserved on paper, bark, cloth, metal, palm leaf, or another material for at least 75 years. Lithographs and printed books are not considered manuscripts. There are thousands of distinct languages and scripts used in manuscripts. One language is frequently written in a variety of distinct scripts. Sanskrit, for instance, can be written in many different scripts, including Devanagari, Grantha, and Oriya. Manuscripts are distinct from historical records that offer direct information on historical events or processes, such as epigraphs on rocks, firmans, and revenue records.

ICT applications in libraries change the roles of librarians and libraries. ICT greatly facilitates the provision of new tools and strategies to preserve documents, to conserve manuscripts, to preserve rare documents, and to transmit information content. Rare books and manuscripts are the only places to find these priceless pieces of knowledge. Numerous antique manuscripts and rare books contribute to the preservation of the nation's



cultural legacy. By collecting manuscripts and rare documents in both qualitative and quantitative ways, many libraries have preserved the history of their country. Both conventional and contemporary techniques are used for the preservation of manuscripts. There is a need to provide systematic knowledge about information retrieval and dissemination in the ICT environment because the digitalization of rare documents and manuscripts has introduced additional storage dimensions (Sutar & Chile, 2021).

2. Review of Related Literature

Several scholarly works have delved into the significance and methodologies surrounding the digitization and preservation of cultural heritage, particularly focusing on manuscripts and historical artifacts. Wagner and Clippele (2023) examines digitization's impact on preserving cultural heritage, emphasizing challenges like intellectual property, access, and the need for a balanced approach to innovation and preservation, advocating global cooperation and awareness for inclusive and sustainable safeguarding in the digital era. Gerami et al. (2022) highlighted the importance of making cultural information available online while ensuring data security and proper management. Mahmood and Khan (2017) and Hasan et al. (2016) discussed digital preservation in specific libraries, emphasizing the benefits and techniques employed. Bakhshi (2016) and Singh and Parabhoi (2016) examined digitization efforts in institutions like IGNCA and the Indian Institute of Advanced Study, detailing the challenges and tools used. Veena (2015) discussed the transition from traditional to digital methods in preservation, citing necessary technologies. Pandher



(2012) focused on the impact of digitization on manuscript survival and user behaviour. Madden and Seifi (2011) explored interdisciplinary research through digitized Persian manuscripts, drawing parallels between contemporary digitization and ancient Persian arts. Londhe et al. (2011) outlined the technical aspects of digitization, emphasizing metadata creation and shortcomings in cataloging. Mazumdar (2009) highlighted US initiatives supporting digital preservation in Indian institutions. Lalitha (2009) stressed the significance of digitizing cultural materials, especially images, noting the absence of standardized quality criteria and advocating for metadata adherence.

3. Objectives of the Study

* To identify the elements influencing the deterioration of library materials.
* To ascertain the present digitization status.
* To determine the selection criteria for the digitization of manuscripts.
* To figure out the plans after digitization.
* To find out the obstacles to digitization.

4. Research Methodology Adopted

Data was gathered through a structured questionnaire with open-ended and closed-ended questions from librarians of various Manuscript Libraries. To facilitate quantification and analysis of data, mainly closed-ended questions were used. Librarians and users are distributed with different questionnaires. The questionnaire for librarians consisted of 57 questions; most of them were close-ended. The questionnaire is divided

into 11 sections. The first part consists of questions concerned with the collection, acquisition, organization, storage, preservation techniques; and digitization of manuscripts.

5. Data Analysis and Interpretation

5.1 Libraries Under Study

Manuscript collections of four institutional libraries in Thiruvananthapuram were taken for the present study. The Institutions are in different type, nature and have different organizational setup and function. Further the volume of manuscript collections deposited in these institutional libraries is also different. But in the present study these institutions with manuscript collections are broadly termed as Manuscript libraries. For the convenience of analysis and presentation this chapter uses only acronyms give to manuscript libraries instead of using their full names. The names of manuscript libraries are:

1. Oriental Research Institute and Manuscript Library (ORI&ML), Thiruvananthapuram
2. Kerala State Archives (ARCH), Thiruvananthapuram
3. Asan Smarakam Thonnakkal (AST), Thiruvananthapuram
4. Sree Chithra Thirunal Grandhasala (SCTG), Thiruvananthapuram



5.2 Establishment of Manuscript libraries

Table 5.1 presents a list of manuscript libraries along with their respective years of establishment.

Table 5.1 Year of Establishment of Libraries

Name of Manuscript Libraries	Year of Establishment
ORI&ML	1908
ARCH	1964
AST	1958
SCTG	1914

The institutions hold significant cultural and historical value in preserving and disseminating valuable manuscripts and archival materials. ORI&ML established in 1908, stands as a hub for oriental manuscripts, fostering research and exploration in diverse disciplines. ARCH founded in 1964, serves as a repository of official documents and records, offering insights into the administrative history of the region. AST established in 1958, commemorates the revered poet Kumaran Asan and houses his literary works and contributions. Lastly, SCTG established in 1914, holds a rich collection of manuscripts and printed materials, enriching the cultural heritage of Thiruvananthapuram and the broader scholarly community. Collectively, these institutions play a pivotal role in preserving, studying, and sharing the invaluable heritage of the region.

5.3 Collection of Different Materials

Table 5.2 provides the collection of different materials in Manuscripts Libraries.

Table 5.2 Collection of Different Materials

Type of Manuscripts	Manuscript Libraries			
	ORI&ML	ARCH	AST	SCTG
Palm leaf	60000	10034	0	47
Paper	5000	1584	101	0
Birch bark	1	0	0	0
Parchment	1	0	0	0
Metal	7	4	0	0
Cloth	1	0	0	0
Stone	1	0	0	0
Bamboo	0	3	0	0
Total	**65076**	**11625**	**101**	**47**

The above study reveals that the primary materials used for manuscripts are Palm Leaf and Paper, followed by other materials in relatively smaller numbers. The use of materials like Birch Bark, Parchment, Metal, Cloth, Stone, and Bamboo is less common and is present only in specific libraries. ORI&ML has the largest collection of manuscripts, totalling 65,000. The majorities of the manuscripts are on palm leaf (60000) and paper (5000). It also has a small number of manuscripts on other materials such as birch bark, parchment, metal, cloth, stone, and bamboo. The ARCH contains 11,625 manuscripts, with a significant number on palm leaf (10,034) and paper (1584). Additionally, there are a few manuscripts on cloth and bamboo. AST has 101 manuscripts, all of which are on paper. SCTG library has 47 manuscripts, all of which are on palm leaf.

5.4 Deterioration of Manuscripts

The deterioration of manuscripts, which are invaluable windows into historical, cultural, and literary realms, is primarily attributed to multifaceted factors. Environmental conditions play a pivotal role, as fluctuations in temperature, humidity, and exposure to light can expedite paper degradation and ink fading. Physical handling, often compounded by inadequate preservation practices, results in mechanical wear, tear, and the transfer of oils and acids from human skin. Biological agents like mold, insects, and rodents can contribute to irreversible damage.

5.4.1 Factors Affecting Deterioration of Manuscripts

The various factors of deterioration and to what extend it causes damages to manuscript are depicted in Table 5.3.

Table 5.3: Factors affecting Deterioration of manuscripts

Factors Affecting Deterioration	ORI&ML	ARCH	AST	SCTG
Dust and Atmospheric Pollution	2	4	2	1
Light and Heat	2	4	3	3
Temperature and Humidity	2	4	3	2
Lack of Proper Storage	2	4	1	4
Biological Agents	2	4	3	2
Human Factors	2	4	1	2

Not at all= 1, Very little = 2, Some What = 3, To a great extent = 4

The table presents a comprehensive overview of the diverse factors contributing to the deterioration of manuscripts across distinct categories: ORI&ML, ARCH, AST, and SCTG. Examining these factors reveals their differential impacts, where certain threats like light and heat, temperature and humidity variations, and biological agents consistently pose moderate to significant risks across all categories. Lack of proper storage emerges as a critical concern for ARCH and SCTG manuscripts, indicating a pronounced vulnerability in these categories. Meanwhile, dust and atmospheric pollution exhibit varied impacts, highlighting their nuanced effects on different types of manuscripts. Human factors, albeit relatively lower in impact, still demonstrate a notable influence on the preservation of manuscripts, emphasizing the need for meticulous care in handling these invaluable artifacts. Understanding these varied influences helps prioritize preservation strategies tailored to address the specific vulnerabilities faced by each manuscript category, ultimately aiding in their long-term conservation and safeguarding against deterioration.

5.4.2 Nature of Deterioration

Manuscripts, over time, can succumb to a range of defects that compromise their integrity and readability. Stains and discoloration can mar the visual appeal and legibility of the text, obscuring the original content. Cracks and cleavage might emerge due to physical stresses or environmental fluctuations, leading to fragmentations and even loss of sections. The gradual brittleness of aging manuscripts renders them susceptible to damage from handling, potentially resulting in tears or breakages. Table 5.4 shows the various defects and to what extend it affect manuscript.



Table 5.4: Nature of Deterioration of Manuscripts

Nature of Deterioration of Manuscripts	ORI&ML	ARCH	AST	SCTG
Stains	1	4	2	1
Discoloration	1	4	2	3
Cracks	4	4	2	2
Cleavage	4	4	1	2
Brittleness	4	4	1	3
Fragility	4	4	1	3

Not at all= 1, Very little = 2, Some What = 3, To a great extent = 4

From the study it is evident that ORI&ML has a high extent of defects across all categories. The defects are at their most severe level in terms of stains, discoloration, cracks, cleavage, brittleness, and fragility. This suggests that the manuscripts in this library have suffered significant damage and degradation. Similar to the ORI&ML, the ARCH also exhibits a high extent of defects in all categories. This implies that the manuscripts in this library have experienced substantial deterioration as well. The AST library shows a relatively moderate extent of defects across all categories. However, cleavage, brittleness, and fragility are less severe. This suggests that while there are some defects presents, they might not be as damaging or extensive as in the previous libraries. SCTG library displays varying extents of defects across different categories. Stains and cleavage are least severe. Discoloration and cracks are somewhat more prominent. However, brittleness and fragility are relatively severe.

ORI&ML and ARCH libraries have manuscripts with the highest levels of defects, indicating a substantial need for preservation efforts. The AST library has a moderate level of defects, while the SCTG library has a mix of relatively mild and moderate defects.

5.5 Digitization Program

The digitization of manuscripts holds immense importance as it transcends time and space limitations, preserving and democratizing access to invaluable historical and cultural artifacts. By converting fragile and often deteriorating physical manuscripts into digital formats, we ensure their long-term preservation, minimizing the risk of loss due to natural disasters or decay. Moreover, digitization democratizes access by making these documents accessible to a global audience, including scholars, researchers, and enthusiasts who might not have had the opportunity to visit physical archives. This process facilitates interdisciplinary research, accelerates knowledge dissemination, and fosters collaborations that contribute to a deeper understanding of our collective heritage.

5.5.1 Digitization Activities Undertaken

Table 5.5 gives a picture of the present status of digitization in manuscript libraries.

Table 5.5 : Digitization Activities Undertaken

Digitisation Status	ORI&ML	ARCH	AST	SCTG
Initiated digitization	Yes	Yes	Yes	No
Present Status of Digitization	Begun but not yet finished	Begun but not yet finished	Begun but not yet finished	Not Yet decided
Year Digitization First Began	2003	2000	2009	-



From the study it is clear that the efforts of several manuscript libraries to digitize their collections for wider accessibility and preservation. All three libraries (ORI&ML, ARCH, and AST) have started digitization programs, indicating a recognition of the importance of preserving and making their manuscript collections accessible in a digital format. SCTG has not yet decided on whether to embark on a digitization program, which could be due to various factors such as resource constraints, prioritization of other projects, or the nature of the manuscript collection. The varying start dates and incomplete statuses indicate the challenges associated with digitization projects. The decision by SCTG not to proceed with digitization might have implications for the accessibility and usability of their manuscript collection in the digital age.

5.5.2 Principal Reasons for Digitization of Manuscripts

The digitization of manuscripts offers numerous benefits, transforming ancient texts into accessible and searchable digital formats. This preservation method safeguards fragile documents from physical deterioration caused by age and handling, ensuring their longevity for future generations. Digitization also enhances global scholarly access, enabling researchers, students, and enthusiasts to study and analyse these manuscripts remotely, breaking down geographical barriers and fostering a wider exchange of knowledge. Additionally, digital archives allow for advanced data manipulation, such as text analysis and linguistic studies, while facilitating collaborative research efforts. Table 5.6 depicts the ranking of major reasons for digitization.

Table 5.6: Ranking of Reasons of Digitization

Manuscript Libraries	ORI&ML	ARCH	AST	SCTG
To preserve the content	1	1	2	3
For better public access	4	2	3	2
To enable new types of access	2	4	4	1
preserve handling of manuscripts	3	3	1	4

From the study it is clear that ORI&ML places content preservation and public access lower, emphasizing new forms of access and use and ranking preserving the handling of original manuscripts last. ARCH values content preservation and enhanced public access as top priorities, while considering facilitating new forms of access and use and preserving handling less important. AST prioritizes facilitating new forms of access and use, content preservation, and preserving the handling of original manuscripts, ranking enhanced public access last. SCTG places the highest importance on facilitating new forms of access and use, followed by enhanced public access and preserving the handling of original manuscripts. Content preservation is ranked the lowest. The analysis of their rankings provides insights into their priorities and considerations when deciding to digitize content.

The ranking preferences vary among different libraries, indicating that their priorities for digitization reasons differ. Manuscript libraries seem to value content preservation and facilitating new forms of access and use, while they rank enhanced public access and preserving the handling of original manuscripts lower.



5.5.3 Criteria for Selection of Manuscripts for Digitization

The selection criteria for digitization of manuscripts encompass three key factors: firstly, the content of the manuscript, ensuring its historical, cultural, or scholarly significance; secondly, the condition of the manuscript, considering its physical state and feasibility of digitization; and finally, the demand of users, assessing the relevance and potential impact of the digitized content on a wider audience. These factors collectively guide the prioritization of manuscripts for digitization, facilitating the preservation, accessibility, and utilization of valuable cultural and academic resources. Table 5.7 shows the various criteria followed by libraries for the selection of manuscripts for digitization.

Table 5.7: Selection Criteria of Manuscript Digitization

Manuscript libraries	Content of manuscript	Condition of manuscript	Demandof users	No specific criteria
ORI&ML	No	No	No	Yes
ARCH	Yes	Yes	Yes	No
AST	No	No	No	Yes
SCTG	No	No	No	No

From the study it is evident that libraries like ARCH prioritize manuscripts with valuable content that are in good condition and have user demand. This user-centered approach ensures that digitization efforts align with what users are interested in accessing. Libraries like ORI&ML and AST appear to prioritize digitization for preservation purposes or other institutional needs, rather than focusing on user demand or content significance. SCTG lacks specific criteria. The libraries that consider user demand and content significance tend to have a more user-centric approach, while others may prioritize preservation or institutional needs.



5.5.4 Barriers to Digitization

The digitization of manuscripts faces several barriers, encompassing technical, logistical, and financial challenges. Fragility and sensitivity of ancient manuscripts pose difficulties in handling and scanning, often requiring specialized equipment and expertise. Varying sizes, languages, and scripts further complicate the standardization of digitization processes. Limited access to funding and resources can hinder large-scale digitization projects, as the required high-resolution imaging, metadata creation, and data storage demand substantial investments. Copyright concerns and intellectual property issues can also impede progress, particularly with manuscripts that are still under copyright protection. Additionally, establishing robust digitization standards and ensuring data security to prevent unauthorized access or loss of valuable historical content presents an ongoing challenge in the digitization efforts of manuscripts.

Table 5.8: Barriers of Digitization of Manuscripts

Barriers of Digitization	ORI&ML	ARCH	AST	SCTG
Inadequate fund	1	3	1	3
Inadequate infrastructure	1	3	2	3
Administrative barriers	1	2	1	3
Lack of initiative from authority	1	1	1	3
Lack of trained staff	1	1	1	4

Not at all= 1, Little extent = 2, Moderate extent = 3, Very great extent = 4



From study it is evident that ORI&ML seems to face relatively low barriers in all categories. This could indicate that they have sufficient funds, infrastructure, administrative support, and technically trained staff to support the digitization process. The ARCH faces higher barriers in terms of inadequate funds and infrastructure. The administrative barriers are also a concern, though to a lesser extent. However, the presence of initiative from the authority and technically trained staff could help mitigate some of these challenges. The AST seems to have adequate funds and relatively low administrative barriers and initiative from the authority. The SCTG faces significant barriers across all categories. There are challenges in terms of funding, infrastructure, administrative support, and initiative from the authority. The most substantial challenge seems to be the lack of technically trained staff, which could hinder the digitization process significantly.

5.5.5 Plans after Digitization

Librarians were asked to express their view about the future plans in connection with the digitization of manuscripts. Table 5.9 depicts the plans after digitization.

Table 5.9: Plan after Digitization

Plan after Digitization	No. of Libraries	Name of the Libraries
Restriction on access to manuscript after digitization	4	ORI&ML, ARCH, AST, SCTG
Plan to develop in- house digitization unit	1	AST
Plan to translate/ transliterate manuscripts	2	ORI&ML, ARCH

From study it is clear that all libraries would restrict direct access to the original manuscript after digitization. AST is planning to develop in house digitization unit. ORI&ML and ARCH are planning to provide translation/ transliteration service to the users. All libraries are agreed to provide digitized manuscript in CD/DVD. Except ARCH all libraries wish to provide access via internet.

6. Findings

The impact of dust and atmospheric pollution on manuscript deterioration is not uniform across libraries. The perception of biological agents' impact on manuscript deterioration is relatively consistent. ORI&ML and ARCH libraries have manuscripts with the highest levels of defects. Defects like cleavage, brittleness, and fragility are less severe in libraries compared to other nature of deterioration. ORI&ML, ARCH, AST have started digitization programs, SCTG has not yet decided on whether to embark on a digitization program. ORI&ML and AST appear to prioritize digitization for preservation purposes or other institutional needs. ARCH prioritize digitization manuscripts with valuable content that are in good condition and have user demand. Inadequate infrastructure, administrative barriers, and Lack of initiative from authority are the major barriers for digitization. All libraries would restrict direct access to the original manuscript after digitization.

7. Conclusion

The study delved into the manifold dimensions of manuscript collections in libraries and archives of Thiruvananthapuram. Through the examination of various objectives, it became evident that the management, preservation, and dissemination of these invaluable cultural artifacts are



influenced by multifaceted factors. The establishment of dedicated staff, coupled with sufficient training in preservation and digitization, emerged as a common need across libraries. Instituting specialized funds for manuscript preservation, offering user orientation programs, and implementing comprehensive preservation policies were vital steps to address various challenges. Collaboration between institutions, awareness campaigns, and the incorporation of advanced preservation technologies can further bolster the effort to safeguard these treasures. By amalgamating tradition and innovation, these libraries can ensure that the manuscripts remain not only artifacts of the past but also vibrant sources of knowledge and inspiration for generations to come.

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