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Managing film heritage in Malaysian state libraries: Practices, constraints, and operational challenges

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ABSTRACT

Audiovisual collections in Malaysian state libraries help preserve national and regional memory but are highly vulnerable due to fragile media, obsolete playback technologies, and limited digital infrastructure. Film collections in these libraries face increasing threats from fragile media, obsolete playback technologies, and limited digital infrastructure. This study examines current management practices, access conditions, and operational challenges in Malaysian state libraries, and develops an empirically grounded framework to support preservation and access. A qualitative approach was employed, involving interviews with fifteen participants from five Malaysian state libraries representing different geographical regions of Malaysia. The findings reveal four key issues: inconsistent and limited metadata practices; reliance on obsolete playback equipment for VHS, VCD, and DVD formats; declining use and low public awareness; and copyright and resource constraints that hinder digitisation efforts. Despite these challenges, participants expressed strong support for structured Digital Asset Management (DAM) approaches, particularly for standardising metadata, strengthening preservation planning, and enabling controlled digital access. Based on these findings, the study proposes a resource-sensitive DAM framework integrating OAIS-aligned workflow logic, audiovisual metadata standards (PBCore and PREMIS), phased digitisation, and multilingual access considerations. The framework is tailored to Malaysian public library realities and may be relevant to similar resource-constrained public library contexts in Southeast Asia.

Keywords: Audiovisual preservation; Metadata standards; Library digitisation; Cultural heritage access; User engagement; Southeast Asian libraries.

INTRODUCTION

Preservation is a core responsibility of libraries and memory institutions, yet audiovisual materials present challenges that differ significantly from print. As time-based media, films and videos capture social history, artistic expression, and collective memory, but fragile carriers, technological obsolescence, and rights complexities make long-term access difficult (Edmondson, 2016; UNESCO, 2018; IASA, 2019; FIAF, 2016). In this study, the term “film collections” is used broadly to refer to recorded moving-image materials held on formats such as VHS, VCD, DVD, and related analogue and digital carriers commonly managed in public library contexts. Effective management, therefore, requires specialised metadata, appropriate playback technologies, and sustained digital preservation strategies (Owens, 2018; PREMIS Editorial Committee, 2015; WGBH Educational Foundation, 2018).

In Malaysia, these responsibilities fall to the state libraries, public libraries administered at the state level and tasked with preserving regional heritage collections, supporting community learning, and providing public access to cultural resources. They are distinct from the National Library and academic libraries, serving as key custodians of state-level cultural memory and information services (National Library of Malaysia, 2020). Their film collections preserve local histories and creative expression, but are often stored on fragile formats such as VHS, VCD, and DVD, many of which depend on obsolete playback technologies (IASA, 2019; FIAF, 2016). Without systematic preservation strategies, many items risk becoming inaccessible.

Practices in Malaysian state libraries reflect persistent structural challenges, including inconsistent cataloguing, limited preservation infrastructure, outdated equipment, and low user engagement, all of which reduce the visibility and use of film collections. A Digital Asset Management (DAM) framework offers a structured approach to managing audiovisual materials by guiding metadata standardisation, preservation workflows, and access planning. Peer-reviewed scholarship positions DAM as a framework for organising, preserving, and providing access to complex and time-based digital collections within libraries and cultural heritage institutions (Baca, 2016; Owens, 2018). Despite wider international adoption, limited research has examined how DAM frameworks can be adapted to manage film collections in public libraries, particularly in developing-country contexts.

Although audiovisual collections are an essential component of cultural heritage, research on their management within public library systems, especially in developing countries, remains limited. Much existing scholarship focuses on national archives, academic libraries, or specialised heritage organisations, leaving public libraries under-represented in discussions of audiovisual preservation (Ngulube, 2003). This gap is also evident in Southeast Asia, where public libraries and state-level institutions commonly face constraints such as limited funding, obsolete playback equipment, inconsistent metadata practices, and shortages of specialised expertise (UNESCO, 2018; IASA, 2019).

In Malaysian context, digital preservation studies have largely focused on academic libraries, specialised heritage initiatives, or national-level efforts, with comparatively limited attention to the operational realities of state libraries and their film collections (Nor Hasni et al., 2023; National Library of Malaysia, 2020; Woo, 2002). Despite facing challenges similar to those reported across the region, Malaysia is rarely situated within this broader comparative context, and to the authors' knowledge, limited research has examined DAM frameworks tailored to the needs, capacities, and multilingual environment of Malaysian state libraries. Consequently, there is limited empirical evidence on how DAM frameworks and standards-based workflows can be adapted for resource-constrained, multilingual public library contexts. This study addresses this gap by developing an empirically grounded DAM framework for Malaysian state libraries with potential relevance to comparable Southeast Asian settings.

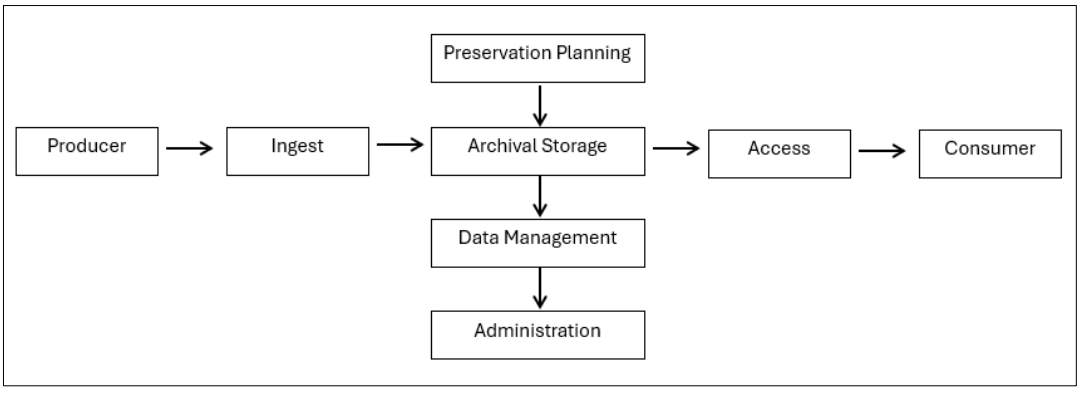
LITERATURE REVIEW

Audiovisual materials are significant cultural resources, but present distinct preservation challenges compared to print-based collections. Their reliance on fragile carriers, specialised playback technologies, and complex rights environments complicates long-term access,

particularly in public library contexts (Edmondson, 2016; UNESCO, 2018). This literature review synthesises four key strands of scholarship relevant to this study: audiovisual preservation challenges and standards; the role of DAM in library and heritage contexts; metadata standards for audiovisual collections; and implementation constraints in public and developing contexts. Together, these strands establish the theoretical and practical foundation for examining film collection management in Malaysian state libraries and for proposing a context-sensitive DAM framework.

Audiovisual materials are widely recognised as among the most at-risk forms of cultural heritage due to format fragility, technological obsolescence, and environmental sensitivity. Magnetic tapes, optical discs, and film formats deteriorate over time and depend on playback equipment that is increasingly scarce, even when physical carriers remain intact (Ngulube, 2003; IASA, 2019). Without timely intervention, audiovisual materials risk becoming permanently inaccessible. International organisations emphasise the cultural significance of audiovisual collections as records of social history, artistic expression, and collective memory. UNESCO identifies audiovisual heritage as a core component of cultural identity and social memory and highlights the urgency of safeguarding these materials through coordinated preservation strategies (UNESCO, 2018). Professional guidelines stress the unique challenges of preserving time-based media and provide guidance for migration, documentation, and format management (IASA, 2019; FIAF, 2016).

The Open Archival Information System (OAIS) reference model provides a conceptual framework for organising preservation responsibilities, workflows, and information management across the lifecycle of digital and digitised materials (Consultative Committee for Space Data Systems, 2024). It defines core functional areas, including ingest, archival storage, data management, access, administration, and preservation planning, which collectively support the long-term sustainability of digital assets. Figure 1 presents a simplified representation of the OAIS functional model, illustrating its core components as a conceptual reference for this study. While the OAIS model provides a comprehensive conceptual structure, it assumes a level of technical and organisational readiness that is not consistently present in Malaysian state libraries. In this study, OAIS is used as a guiding framework to structure data collection and analysis, rather than as a direct implementation model. The proposed DAM framework presented later adapts these functional components to reflect the operational constraints identified in the findings.



Note: Adapted from Consultative Committee for Space Data Systems (2024)

Figure 1: Simplified OAIS functional model

Standards such as Preservation Metadata: Implementation Strategies (PREMIS) Data Dictionary and Public Broadcasting Metadata Dictionary (PBCore) support documentation of preservation actions, technical characteristics, and rights information for audiovisual materials (PREMIS Editorial Committee, 2015; WGBH Educational Foundation, 2018). Collectively, these standards provide a shared structure for systematic audiovisual preservation, although existing literature notes uneven adoption outside well-resourced archival and national institutions (Edmondson, 2016; Ngulube, 2003).

DAM has been adopted by libraries and heritage institutions as an environment for organising, preserving, and providing access to digital and digitised materials. In contrast to general digital library systems, DAM supports metadata-driven workflows, rights documentation, preservation planning, and controlled access for complex digital objects, including time-based media (Corrado & Moulaison-Sandy, 2017; Baca, 2016). Large heritage institutions demonstrate how DAM-oriented approaches can support audiovisual preservation through integrated digitisation workflows, metadata management, and long-term storage planning. National libraries and cultural heritage organisations have articulated structured digital preservation strategies that combine policy frameworks, collection profiling, and technical planning, illustrating how preservation principles can be operationalised in well-resourced institutional contexts (Day, 2014; New York Public Library, 2019; National Library Board Singapore, 2024).

In the Malaysian context, early digitisation initiatives, such as the Digital Library of Historical Buildings, demonstrated the potential of digital access but lacked the structured DAM components found in more recent preservation initiatives (Woo, 2002). Recent scholarship has given increasing attention to structured digital preservation practices in libraries, particularly in relation to metadata consistency, sustainable storage, and long-term access (Cox et al., 2017; Masenya & Ngulube, 2020). While Media Asset Management systems are commonly discussed in broadcasting and production environments, this study focuses specifically on DAM in library and heritage contexts, where preservation responsibility, governance, and public access priorities differ. Existing scholarship positions DAM not as a standalone technology, but as an implementation environment through which preservation standards and institutional workflows can be translated into practice (Owens, 2018).

Metadata is central to both access and preservation of audiovisual materials. Effective digital preservation depends on descriptive, technical, administrative, and preservation metadata that document provenance, format characteristics, rights status, and preservation actions (Baca, 2016; Corrado & Moulaison-Sandy, 2017). Standards such as Dublin Core Metadata Element Set (Dublin Core), PREMIS, and PBCore provide structured approaches for describing time-based media and supporting interoperability across systems (Baca, 2016). PBCore is widely used to describe audiovisual content, including intellectual content, instantiation details, and technical attributes, whereas PREMIS focuses on documenting preservation actions, events, agents, and rights (PREMIS Editorial Committee, 2015; WGBH Educational Foundation, 2018). Together, these standards support discoverability, preservation planning, and long-term management of audiovisual collections. Research consistently shows that metadata quality directly affects user access, system interoperability, and the sustainability of digital preservation initiatives (Baca, 2016; Owens, 2018). Despite their importance, metadata practices for audiovisual materials remain inconsistent in many library contexts. Metadata creation is labour-intensive and requires specialised expertise, which many public libraries lack (Ngulube, 2003). Research has reported uneven cataloguing practices and limited staff capacity for creating audiovisual

metadata in resource-constrained library environments, affecting access and long-term preservation (Ngulube, 2003; Baca, 2016). These findings reinforce the need for simplified, standards-aligned metadata approaches that are feasible within public library environments.

Although preservation standards and DAM frameworks are well established, their implementation in public libraries and developing contexts is shaped by persistent structural constraints. Studies consistently identify limited funding, inadequate infrastructure, shortages of trained personnel, and gaps between policy and practice as major barriers to sustainable digital preservation initiatives (UNESCO, 2018; Ngulube, 2003). Research on DAM and digital library initiatives highlights institutional readiness, staff capacity, and organisational support as critical determinants of successful implementation. Studies applying the DeLone and McLean Information Systems Success Model demonstrate that system quality, information quality, and service quality significantly influence user satisfaction and continued use, reinforcing the importance of organisational readiness and user-centred implementation strategies (Alzahrani et al., 2019). Empirical research further shows that weak institutional commitment, staffing constraints, limited funding, and the absence of clear standards and policies undermine the sustainability of digital preservation efforts in library contexts (Masenya & Ngulube, 2020; Cox et al., 2017).

In Malaysia, digital preservation research has largely focused on academic and national institutions, leaving state libraries comparatively under-examined despite their role in safeguarding regional heritage (Nor Hasni et al., 2023). Existing studies report uneven technological readiness and sustainability challenges in Malaysian library contexts (Nor Hasni et al., 2023), while broader literature also highlights metadata inconsistency and limited digitisation capacity in resource-constrained institutions (UNESCO, 2018; IASA, 2019). Linguistic diversity further shapes implementation constraints. Malaysian public libraries serve multilingual communities, requiring cataloguing systems and access platforms that support description and retrieval across multiple languages. International guidelines emphasise multilingual metadata and inclusive access as essential in multicultural societies (International Federation of Library Associations and Institutions, 2009), yet these requirements add complexity to implementation in already resource-constrained environments.

Studies of audiovisual preservation in developing regions report similar conditions. Environmental instability, obsolete playback equipment, and limited digitisation capacity increase the risk of permanent loss for audiovisual materials stored on legacy formats (UNESCO, 2018; IASA, 2019). Regional research across Southeast Asia highlights shared constraints, including funding limitations, technological obsolescence, and shortages of specialised expertise, as well as inconsistent metadata practices and limited interoperability among Galleries, Libraries, Archives, and Museums (GLAM) institutions (Kwiecien et al., 2025). Taken together, this literature highlights a persistent gap between established audiovisual preservation standards and their practical implementation in public libraries operating under resource constraints. This gap is particularly evident in state-level public libraries, where preservation mandates coexist with limited technical and organisational capacity. The present study addresses this gap by examining film collection management practices in Malaysian state libraries and proposing a DAM framework grounded in empirical findings and adapted to local operational realities.

METHOD

A qualitative research design was adopted to capture the context-specific realities of managing film collections in Malaysian state libraries. This approach is appropriate for examining practices, perceptions, and challenges that are embedded in institutional and organisational contexts and are not easily captured through quantitative methods. An exploratory descriptive strategy was used to document existing practices and to inform the development of a context-sensitive framework. This study was guided by four research objectives:

i. To examine current practices in managing film collections in Malaysian state libraries
ii. To investigate the accessibility and usage of film collections in Malaysian state libraries
iii. To identify the constraints encountered by Malaysian state libraries in managing film collections
iv. To propose a Digital Asset Management (DAM) framework for film collections in Malaysian state libraries

Population and sampling

The study focused on participants directly involved in film collection management in five Malaysian state libraries, each representing a different geographical region:

i. North: Perbadanan Perpustakaan Awam Kedah
ii. South: Perbadanan Perpustakaan Awam Negeri Sembilan
iii. East: Perbadanan Perpustakaan Awam Terengganu
iv. West: Perbadanan Perpustakaan Awam Selangor
v. Central: Perpustakaan Kuala Lumpur

Malaysia has 14 State Public Libraries administered at the state level, which vary in size, resources, and regional context. A multisite purposive sampling strategy was adopted to ensure variation across geographical regions and institutional characteristics. Five libraries were selected, one from each major region, based on regional representation, library size, the presence of film collections, and willingness to participate. Within each selected library, role-based purposive sampling was used to recruit participants directly involved in film collection management. Three participants were selected from each site: a senior manager, a staff member responsible for film collections, and a support staff member. Participant selection was guided by recommendations from library administration and prioritised individuals with direct experience in cataloguing, preservation, or user services related to film collections. This approach yielded a total sample of 15 participants and ensured representation across managerial, operational, and support roles.

Data collection

Primary data were gathered through semi-structured interviews, which allowed flexibility to explore participants' perspectives while remaining aligned with the research objectives. The interview guide (see Appendix 1) was organised around eight themes mapped to the research objectives: current practices in film collection management, management and preservation challenges, accessibility and usage patterns, potential roles of a DAM framework, integration of new technologies, institutional support and resources, anticipated benefits and concerns, and additional feedback.

Data collection and interpretation were informed by the OAIS reference model, which served as a conceptual lens for understanding ingest, management, access, and long-term preservation responsibilities within Malaysian state libraries. OAIS informed the design of

interview questions by mapping participants practices and challenges to core functional areas such as ingest, data management, access, and preservation planning, and was subsequently used as an analytical lens during thematic interpretation. Table 1 maps core OAIS functions to the interview themes used in data collection and analysis. This alignment supported the use of OAIS as an analytical lens while adapting its concepts to the operational realities of Malaysian state libraries.

Table 1 : Alignment of OAIS functions with interview themes

OAIS Function	Interview Focus
Ingest	Acquisition and handling of film materials
Data Management	Metadata and cataloguing practices
Access	User accessibility and usage conditions
Preservation Planning	Digitisation needs, risks, and sustainability concerns

Interviews continued until thematic saturation was reached, defined as the point at which no substantively new themes emerged across libraries or participant roles. Interviews were conducted by telephone or online platforms, depending on participant availability, between August and December 2024. Each interview lasted approximately 30–40 minutes and was audio-recorded with participant consent, supported by field notes. Secondary sources were consulted to provide contextual background; however, the findings reported in this study are derived primarily from participants' accounts, as internal institutional documentation could not be shared due to organisational and confidentiality constraints.

Data analysis

Interviews were transcribed and analysed using thematic analysis, following Braun and Clarke's (2006) framework. The analysis involved familiarisation with the data, inductive coding, theme development, and refinement. Recurring patterns were identified in film collection management practices, preservation and access challenges, user engagement, and participants' perspectives relevant to the development of a DAM framework. Excel was used to support the coding and organisation of themes. Themes were refined through iterative comparison across transcripts, and to enhance dependability, a subset of transcripts was double-coded, with discrepancies discussed until agreement was reached.

The credibility of the research data was confirmed through cross-validation across participant roles and libraries. Member checking was conducted by sharing interview summaries with selected participants, who confirmed their accuracy. Dependability was supported by maintaining a clear audit trail of coding decisions and theme development.

RESULTS

i. Current practices of film collection management

The current practices of film collection management in Malaysian state libraries, were reported based on cataloguing methods, metadata practices, storage conditions, and preservation activities. All participating libraries-maintained film collections, although the size, format, and condition of these collections varied between institutions. Most collections comprised VHS, VCD, and DVD formats, with only a few libraries beginning to acquire digital formats. Cataloguing practices were inconsistent: some libraries used MARC records in their

OPAC, while others relied on spreadsheets or card indexes. Metadata was often minimal, typically limited to basic descriptive fields, which restricted discoverability.

As one participant noted:
"*The films are assigned numerical codes and labelled based on genre.*" (P3, librarian).

Storage conditions also varied. Major libraries used climate-controlled storage facilities for their collections, whereas smaller libraries stored films on open shelves without environmental controls. None had specialised preservation equipment, and playback relied on ageing audiovisual equipment located in dedicated viewing rooms. One participant described their setup as:

"*… clearly labelled shelves, categorised by genre...*" (P7, multimedia assistant).

Preservation practices focused primarily on physical management. Libraries avoided creating digital backups due to copyright concerns and instead relied on redundancy, keeping multiple copies of items. Routine inspections were standard, with damaged items removed from circulation and marked in KOHA as "LUPUS" (withdrawn or written off).

Table 2 shows film collection management practices across five Malaysian state libraries and highlights clear variation in cataloguing approaches, storage conditions, and inspection practices. Libraries using MARC records within OPAC systems (Libraries A and D) demonstrated comparatively more structured cataloguing and clearer management workflows. However, even in these libraries, metadata remained limited and preservation activities focused primarily on physical handling rather than digital preservation.

Table 2: Comparative overview of film collection management in five Malaysian state libraries

Library	Cataloguing Method	Storage Method	Inspection Practices	Notes
A	MARC/OPAC	CDs, DVDs on genre-labeled shelves	Manual inspections, Google Forms	Labor-intensive
B	Spreadsheet	VHS tapes, categorized by subject	Visual assessment only	Aging equipment
C	Card index	CDs, DVDs in multimedia unit	Regular checks, 'LUPUS' in KOHA	No digital preservation
D	MARC/OPAC	DVDs stored by genre, limited space	Periodic playback testing	Fragile media
E	Spreadsheet	CDs, DVDs, organized by year	Visual-only inspections	Space constraints

Source: Interview data

Across all five libraries, reliance on analogue formats and physical storage was consistent, regardless of differences in cataloguing methods. The absence of digitisation initiatives and specialised preservation equipment indicates a shared dependency on legacy formats and manual inspection routines. This pattern suggests that although individual libraries have adopted different organisational approaches, systemic constraints such as limited resources,

ageing media, and the lack of digital preservation infrastructure continue to shape film collection management practices across Malaysian state libraries.

ii. Accessibility and usage of film collection

The findings indicate that the film collections were underutilised compared to print materials. Participants described a general decline in borrowing, particularly for VHS and VCD formats, which many patrons can no longer play at home. DVDs were seen as having relatively higher demand, especially among students and researchers seeking historical or documentary content.

As one participant noted, "*Educational documentaries are borrowed more often than fiction films*." (P11, senior librarian).

Most library patrons accessed films on-site due to a lack of home-playback equipment. Usage was often recreational or nostalgic rather than research-driven. Younger users showed limited interest in physical films and preferred streaming platforms. As one participant explained:

"*Most patrons prefer online streaming services.*" (P6, assistant librarian).

Urban libraries (e.g., Selangor, Kuala Lumpur) reported slightly higher engagement, particularly when films were linked to cultural programmes or school outreach. However, even in these settings, usage remained modest. Participants generally avoided lending fragile formats such as VHS and VCDs to prevent damage:

"*We do not allow VHS tapes to be borrowed because they are too easily damaged.*" (P7, multimedia assistant).

Promotional activities were limited. As one participant acknowledged, many patrons were unaware of the films because are dated:

"*Most materials are in outdated formats*." (P2, librarian).

iii. Constraints in managing film collections encountered by Malaysian state libraries

The operational challenges in preserving and providing access to film collections were attributed to technological, organisational, and institutional factors.

a. Technological barriers

The fragility of analogue formats was the most pressing concern, with VHS tapes particularly susceptible to mould, brittleness, and playback failure:

"Playback devices like VCD and VHS players are scarce, and many are no longer functional." (P8, audiovisual technician)

All libraries reported difficulties in maintaining obsolete equipment and the risk of permanent loss for undigitised materials.

b. Metadata and cataloguing limitations

Inadequate cataloguing and metadata further restricted access. Many records lacked subject headings, language descriptors, or genre classifications, making films difficult to locate in OPAC searches and contributing to underutilisation. Metadata gaps were identified based

on participants' accounts, with participants consistently reporting missing subject, language, and genre descriptors in existing catalogue records:

"*The films are assigned numerical codes and labelled based on genre, but there is no subject or language information.*." (P3, librarian).

c. Resource and organizational constraints

Resource constraints compounded these issues. Most libraries lacked funding for digitisation technology, preservation infrastructure, or specialised staff training. Film management was often an additional responsibility assigned to participants without audiovisual expertise:

"*Balancing older materials with new acquisitions has become increasingly complex.*" (P12, librarian).

"*We do not have the budget or expertise to digitise these collections.*" (P4, library assistant),

d. User engagement and promotion issues

The lack of systematic promotional strategies restricted user engagement. According to participant accounts, only two of the five libraries reported including film collections in marketing or promotional activities, and the declining popularity of physical media further reduced patron motivation to access these collections.

"*We rarely promote the film collection because most materials are in outdated formats.*" (P2, librarian).

e. Institutional barriers and participants concerns

While participants generally supported DAM, some expressed concerns about increased workload and top-down decision-making.

"*Implementing a new system will add to our workload unless we receive more support."* (P11, senior librarian).

Subtle hesitation was also noted regarding copyright uncertainty and concerns about the long-term sustainability of DAM initiatives.

Regarding the adequacy of institutional support and resources, findings show that most libraries face significant resource constraints. Funding for digitisation and preservation infrastructure is limited, and participants often lack specialised training in audiovisual management. Film collection management is frequently an additional responsibility for participants, rather than a dedicated role, and only a minority of libraries actively promote their film collections. These factors collectively contribute to the challenges in maintaining and increasing user engagement with film collections.

iv. The proposed DAM framework

The development of the proposed DAM framework is based on both established theoretical models and empirical findings from this study. Foundational frameworks, particularly those associated with the OAIS, the Library of Congress, and the IASA, provide a structured basis for organising digital asset lifecycles, including ingest, storage, data management, access, and preservation planning. While these models offer a comprehensive conceptual structure, they are largely developed within well-resourced institutional environments and assume the

presence of standardised workflows, consistent metadata practices, and stable technological infrastructure.

The findings indicate that Malaysian state libraries often operate without the standardised workflows, consistent metadata practices, technical infrastructure, and specialised preservation capacity assumed in many established DAM and preservation models. Although a range of challenges was identified, these were closely interconnected, particularly in relation to metadata and workflow weaknesses and constrained access conditions. Across all participating libraries, metadata practices were inconsistent and minimal, with frequent absence of subject, language, and genre descriptors. Cataloguing approaches varied across MARC-based systems, spreadsheets, and manual indexes, resulting in uneven description and limited interoperability. At the same time, workflows for handling film materials, particularly analogue formats, were largely informal and lacked standardised procedures for digitisation, metadata creation, and quality control. These conditions limited the discoverability and organisation of film assets and complicated efforts to manage them systematically over time.

Participants also associated these limitations with broader access constraints. Continued reliance on analogue formats such as VHS, VCD, and DVD, along with declining availability of functional playback equipment, restricted both on-site and remote use. In this context, format obsolescence acted as both a preservation and access constraint, as materials that could not be rendered through available playback technologies became effectively inaccessible regardless of physical condition. These limitations were further shaped by restricted digitisation activity, copyright uncertainty, and resource constraints, which together limited the development of accessible digital delivery mechanisms and contributed to the low visibility and use of film collections.

Despite these challenges, participants expressed optimism about the potential role of a DAM framework in improving film collection management. They saw DAM as a means of improving cataloguing consistency and metadata quality, enhancing discoverability, reducing manual workload, and supporting more systematic preservation activities. As one participant noted:

“DAM could automate cataloguing tasks and maintain consistent metadata, but we need training and resources to make it work” (P1, cataloguing librarian).

Participants also viewed DAM to reduce physical storage pressures and protect fragile materials through digitisation. Improved accessibility through OPAC integration and controlled digital delivery was frequently identified as a practical response to obsolete playback technologies and restricted on-site access. As one participant observed, DAM would allow users to access films:

“Without requiring specialised playback equipment” (P9, audiovisual assistant).

Some participants further suggested that DAM-supported virtual exhibitions and social media outreach could help revitalise user engagement, particularly among younger audiences. However, participants consistently emphasised that implementation would remain constrained by copyright uncertainty, budget limitations, staffing capacity, and uneven technical readiness across libraries.

To clarify the relationship between the empirical findings and the proposed framework, Table 3 maps current practices and key challenges to the corresponding structural responses included in the framework.

Table 3: Mapping of current practices, key challenges, and proposed DAM framework

Current practice	Key challenges	DAM framework response	Expected functional outcome
Minimal metadata with missing subject, language, and genre descriptors	Poor discoverability and limited retrieval	Metadata standardisation using PBCore and PREMIS within the processing component	More consistent description and improved searchability
Inconsistent cataloguing across MARC, spreadsheets, and manual indexes	Lack of interoperability and fragmented workflows	Structured ingestion and processing workflows with standardised data entry	Greater consistency in asset management practices
Reliance on analogue formats such as VHS, VCD, and DVD	Format obsolescence and risk of content loss	Phased digitisation and format migration strategies	Reduced dependence on obsolete media and support for long-term preservation
Use of ageing or unavailable playback equipment	Restricted access and limited usability	Creation of digital access copies and platform-independent delivery	Increased usability without reliance on physical playback devices
Access limited to on-site use with low user engagement	Low visibility and underutilisation of collections	Access and delivery component incorporating controlled digital access	Expanded access pathways and potential for increased use
Absence of systematic preservation planning	Risk to long-term sustainability of collections	Adoption of OAIS-aligned preservation workflows and repository structure	More structured and coordinated preservation activities
Limited funding and staff capacity	Constraints on implementation and sustainability	Phased implementation and capacity-building strategies	Gradual adoption aligned with institutional resources
Copyright uncertainty restricting digitisation and access	Barriers to digital access and reuse	Governance component incorporating rights management and access control mechanisms	Legally compliant and controlled access to digital assets

The proposed framework comprises five interrelated components: asset ingestion, processing and standardisation, DAM core system, access and delivery, and governance. These components operate as a connected system rather than a strictly linear sequence. The ingestion and processing components address inconsistencies in workflows and metadata practices, while the access component responds to technological and institutional constraints affecting usability. The DAM core system supports storage and indexing, and governance provides the foundation for policy implementation, standards alignment, and rights management across the framework.

Figure 2 illustrates a DAM workflow synthesised from participants' insights, highlighting strategies for metadata integration, storage, and preservation planning. The workflow demonstrates how libraries can move from fragmented practices to a more systematic and standards-aligned approach, while remaining sensitive to operational constraints. Its applicability depends on institutional capacity, legal considerations, and organisational support.

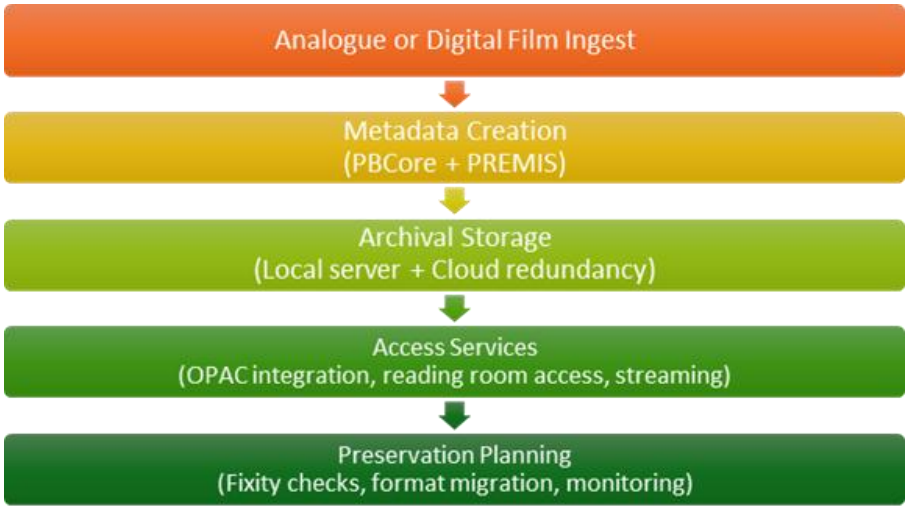


Figure 2: The proposed DAM workflow

Given the variation in capacity observed across the participating libraries, the framework is intended to support incremental implementation. Initial efforts may focus on strengthening metadata practices and establishing basic ingestion workflows, as these directly address the most immediate constraints identified. More advanced components, such as integrated access systems and expanded digitisation initiatives, may be developed progressively as resources, infrastructure, and expertise evolve. This phased approach reflects the practical reality that DAM implementation in this context is a gradual process shaped by institutional readiness.

DISCUSSION

The findings indicate that participants regarded film collections as valuable cultural and educational resources, but also perceived them as underused due to analogue dependence, inconsistent metadata practices, limited preservation infrastructure, and restricted access conditions. Participants linked these challenges to outdated playback technologies, limited digitisation efforts, and resource constraints. Film collection management in Malaysian state libraries remains largely analogue and inconsistently structured, with variation in cataloguing methods, metadata practices, and preservation activities across libraries. Preservation activities focused primarily on physical management. These patterns align with research showing that public libraries often face difficulties implementing comprehensive audiovisual preservation workflows due to funding, staffing, and technical constraints (Ngulube, 2003; Edmondson, 2016). The limited adoption of OAIS, PREMIS, and PBCore further reflects the gap between established preservation standards and operational realities in resource-constrained public library environments (Corrado & Moulaison-Sandy, 2017).

Participants perceived film collections as underused due to limited accessibility, reliance on analogue formats, and poor discoverability within existing cataloguing systems. Dependence on obsolete playback technologies and the lack of digital access options restricted both on-site and remote engagement, particularly among younger users. Incomplete subject, language, and genre information further limited discoverability within OPAC systems and contributed to low usage. These findings support research indicating that weak metadata and limited access mechanisms can reduce the visibility and use of audiovisual collections (Ngulube, 2003; Owens, 2018).

The findings indicate that preservation and access challenges are shaped primarily by institutional and resource constraints rather than resistance to technological change. Limited funding, obsolete equipment, insufficient training, copyright uncertainty, and uneven staffing capacity collectively restricted digitisation and long-term preservation efforts. Similar challenges have been reported across public libraries and GLAM institutions in Southeast Asia, particularly regarding resource limitations, technological obsolescence, and limited institutional capacity (IASA, 2019; UNESCO, 2018; Kwiecien et al., 2025). Participants identified workload, sustainability, and institutional readiness as key barriers.

Participants generally supported the adoption of a DAM framework, particularly for improving metadata consistency, supporting digitisation, and enabling controlled digital access. This aligns with scholarship positioning DAM as a practical approach for operationalising preservation standards and workflows (Owens, 2018). The proposed framework adapts established DAM principles into a phased approach grounded in empirical evidence. Drawing on the OAIS, the framework translates preservation principles into practical actions for resource-constrained public libraries. Metadata standardisation using simplified PBCore and PREMIS elements addresses discoverability and preservation planning (PREMIS Editorial Committee, 2015; WGBH Educational Foundation, 2018), while phased digitisation prioritises at-risk materials without assuming immediate large-scale conversion. Controlled access mechanisms respond to copyright and technological constraints. The framework assumes uneven infrastructure and limited staffing. This challenges an implicit assumption in much DAM literature that institutions begin from a position of technical readiness. In this study, DAM functions as a scaffold for gradual capability development rather than an end state, strengthening its relevance for comparable public libraries.

Several practical implications emerge from the proposed DAM framework. Structured metadata practices using simplified PBCore and PREMIS elements may improve discoverability and support long-term management of film collections. A phased digitisation approach prioritising fragile and at-risk materials offers a realistic strategy for resource-constrained libraries. Participants also highlighted the importance of training and incremental implementation. As digital access capabilities develop, DAM-aligned practices may also strengthen user engagement and accessibility.

The proposed DAM framework adapts established preservation principles, including OAIS, PREMIS, and PBCore, to the operational realities of Malaysian state libraries. Although grounded in the Malaysian context, the framework may also offer practical insights for comparable public library and GLAM environments across Southeast Asia facing similar resource and infrastructure constraints.

CONCLUSIONS

This study provides empirical insights into the management of film collections in Malaysian state libraries and proposes a DAM framework grounded in the operational realities of state-level public libraries. Unlike existing research, which focuses primarily on national archives or academic institutions, this study addresses a documented gap by examining everyday practices, challenges, and participant perspectives within state libraries. The proposed framework integrates established international standards with local operational constraints through a phased and practical approach.

The contribution of this research lies in its applied and empirical focus. Drawing directly on participant experiences, the study demonstrates how standards such as the Open Archival Information System (OAIS), Preservation Metadata: Implementation Strategies (PREMIS), and Public Broadcasting Metadata Dictionary (PBCore) can be adapted into achievable practices within environments characterised by limited funding, uneven infrastructure, and constrained staff capacity. The framework emphasises incremental improvements in metadata practices, phased digitisation, capacity building, and user-centred access, providing practical guidance for practitioners while extending scholarly understanding of audiovisual preservation in developing public library contexts.

Although grounded in the Malaysian context, the challenges identified, including technological obsolescence, inconsistent metadata practices, limited preservation infrastructure, and multilingual access requirements, reflect conditions reported in public libraries across Southeast Asia. As such, the proposed DAM framework may also inform comparable public library environments in the region, while requiring adaptation to local institutional conditions.

Several limitations should be acknowledged. The study involved five Malaysian state libraries and therefore does not represent the full national landscape. As a qualitative multisite study, the aim is analytical transferability rather than statistical generalisation. Data collection relied primarily on participant interviews and reflects institutional perspectives and operational constraints. User perspectives were beyond the scope of this study and should be incorporated in future research to examine user needs and access outcomes. In addition, the proposed framework has not been pilot tested, and its long-term feasibility, costs, and organisational impact remain to be evaluated. Future research could expand the sample to include additional libraries, incorporate user perspectives, or examine the framework through pilot implementation or comparative regional studies.

Overall, this study affirms the cultural and informational value of film collections in public libraries and highlights the potential role of a DAM framework in supporting long-term preservation and access. By translating OAIS-aligned principles into phased and achievable actions for state libraries, the framework offers a practical pathway for strengthening audiovisual heritage management in resource-constrained public library settings.

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CONFLICT OF INTEREST

The authors have no relevant competing interests to declare.

ETHICAL APPROVAL AND INFORMED CONSENT STATEMENTS

This study was reviewed and approved by the University of Malaya Research Ethics Committee (UMREC; Ethics Code: UM.TNC2/UMREC_4005). All participants provided informed consent prior to participation, and their confidentiality and anonymity were strictly maintained in accordance with relevant ethical guidelines.

AUTHOR CONTRIBUTIONS

Conceptualization: [Nur Haziqah, H. and Ranita, H. S.], Methodology: [Nur Haziqah, H.], Formal analysis and investigation: [Nur Haziqah, H.], Writing – original draft preparation: [Nur Haziqah, H.], Writing – review and editing: [Nur Haziqah, H. and Ranita, H. S.]

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Appendix 1: Interview guide questions

Interview Question	Research Objective(s) Addressed
Current Practices	
Could you describe your experience in managing film collections at your library?	RO1
What methods or tools do you currently use to organise and manage the film collections?	RO1
How do you monitor the availability and physical condition of the films?	RO1
Challenges in Film Collection Management	
What are the main challenges you face in managing film collections?	RO3
Are there specific difficulties related to film preservation or user access?	RO3
Have you experienced challenges in adopting new technologies or workflows?	RO3
Accessibility and Usage Patterns	
How accessible are the film collections to users at present?	RO2
How does accessibility influence usage levels or user feedback?	RO2
What barriers, if any, do users face when accessing these collections?	RO2
Potential of DAM Systems	
How familiar are you with Digital Asset Management concepts or practices?	RO4
How could a DAM framework support the organisation, preservation, and access of film collections?	RO4
Technological and Organisational Constraints	
What constraints have you faced when introducing new technologies or workflows?	RO3
Have issues such as budget limitations, staff capacity, or technical readiness affected adoption?	RO3
Support and Resources	
What forms of institutional support or resources assist you in managing film collections?	RO1, RO4
Have training, collaborations, or existing tools influenced current practices?	RO1, RO4
Anticipated Benefits and Concerns	
What benefits or concerns do you anticipate from adopting a DAM framework?	RO4
Do you foresee improvements in efficiency, or potential challenges in implementation?	RO3
Additional Feedback	
Is there anything else you would like to share about film collection management or DAM-related needs?	RO1, RO2, RO3, RO4