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Information Analysis for Developing Pagoda Metadata Elements for Libraries in Myanmar *

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Abstract

This research aims to analyze information related to the development of pagoda metadata standards for libraries in Myanmar. It is part of a broader effort to develop metadata standards for pagoda information in the future. The research methodology is qualitative and involves referencing data from studies on metadata requirements by the National Library and university libraries in Myanmar that have been conducted previously. These studies serve as the foundation for developing metadata standards based on the Functional Requirement for Bibliographic Records (FRBR) Model. The analysis of data records within metadata standards suitable for cultural information management includes categories like Categories for the Description of Works of Art (CDWA) and Visual Resources Association (VRA Core). The research also encompasses the analysis of information to develop metadata that includes content, context, and structure. The results of this analysis are linked to the characteristics of Myanmar pagoda description and the metadata requirements of librarians. This detailed information serves as the basis for the development of metadata standards for managing catalog data in Myanmar moving forward.

Keywords: Pagoda metadata; Metadata elements; Information analysis; Myanmar pagoda; Myanmar libraries

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การวิเคราะห์สารสนเทศเพื่อการพัฒนารายการข้อมูลเมทาดาตาเจดีย์สำหรับห้องสมุดในเมียนมาร์ *

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บทคัดย่อ

งานวิจัยนี้มีจุดมุ่งหมายเพื่อวิเคราะห์สารสนเทศที่เกี่ยวข้องกับการพัฒนาข้อมูลเมทาดาตาเจดีย์สำหรับห้องสมุดในประเทศเมียนมาร์ เป็นส่วนหนึ่งของการวิจัยเพื่อพัฒนามาตรฐานเมทาดาตาเพื่อการจัดการข้อมูลเจดีย์ในขั้นตอนต่อไป วิธีวิจัยใช้วิธีการเชิงคุณภาพ โดยการอ้างอิงข้อมูลจากผลการศึกษาความต้องการเมทาดาตาของบรรณารักษ์หอสมุดแห่งชาติและห้องสมุดมหาวิทยาลัยในประเทศพม่าที่ได้ดำเนินการไปก่อนแล้ว นำมาร่างแนวทางการพัฒนาเมทาดาตาตามกรอบแนวคิด Functional Requirement for Bibliographic Records หรือ FRBR Model การวิเคราะห์รายการข้อมูลที่ปรากฏในมาตรฐานเมทาดาตาที่เหมาะสำหรับการจัดการสารสนเทศทางวัฒนธรรม ได้แก่ Categories for the Description of Works of Arts (CDWA) และ Visual Resources Association (VRA Core) และแนวคิดการวิเคราะห์สารสนเทศเพื่อพัฒนาเมทาดาตาที่ประกอบด้วย เนื้อหา บริบท และโครงสร้าง ผลการวิเคราะห์สารสนเทศโดยเชื่อมโยงกับคุณลักษณะของเจดีย์ในเมียนมาร์และความต้องกา เมทาดาตาของบรรณารักษ์ ทำให้ได้รายละเอียดของข้อมูลที่จำเป็นในส่วนที่เป็นเนื้อหา บริบท และโครงสร้าง ซึ่งจะใช้เป็นฐานในการพัฒนามาตรฐานเมทาดาตาสำหรับการจัดการข้อมูลเจดีย์ในเมียนมาร์ต่อไป

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1. Introduction

The 'pagoda data' is an extensive collection of information about Myanmar's pagodas sourced from both national and academic libraries. It explores various aspects related to pagoda data, providing a nuanced understanding of the cultural and historical importance of these structures, including associated dates. The intentional design of this study aims to capture intricate details such as religious significance, historical context, artifact descriptions, geographical information, digital preservation, and access levels for pagodas. The goal is to gather metadata elements customized for Myanmar pagoda data.

To accurately represent pagodas' unique characteristics, specialized metadata elements are crucial. This research, outlined in the following sections, addresses key questions:

What is the process for conducting metadata analysis of Myanmar pagoda elements with the FRBR model?

What are the existing metadata standards and their associated data elements?

What elements are involved in the analysis of metadata elements?

The study focuses on developing a comprehensive set of metadata elements for a dedicated pagoda metadata schema in Myanmar libraries. By comparing and selecting appropriate elements, the aim is to enhance the organization and searchability of pagoda data, ultimately improving access to these valuable cultural resources within the library context.

2. Literature Review

Library management systems are vital for organizing collections, including pagoda data. These systems streamline cataloging, acquisition, and access, ensuring efficient management. Professionals like museum registrars and librarians use metadata to organize, describe, and enhance access to information objects, facilitating easy searching and browsing of pagoda data (Tochukwu & Henrieta, 2015; Beca, 2008).

In the dynamic realm of pagoda data management within Myanmar's library system, a sophisticated approach was imperative. Metadata standards played a pivotal role in providing a structural foundation for the organization and description of pagoda-related information resources. Dublin Core (Kakali et al., 2007a, 2007b; National Information Standards Organization (U.S.), 2001; Sugimoto et al., 2002; Sutton & Mason, 2001), with its 15 elements, and (Alemneh, 2007; Gartner, 2003; Guenther, 2003; Library of Congress Standards, 2022), an XML schema boasting 20 elements, emerged as key players. Additionally, VRA Core (Eklund, 2007), tailored for visual cultural artifacts, presented 19 elements, while CDWA (Harpring, 2022), embodying best practices, provided a comprehensive framework. The selection of the most suitable metadata standards for historical data related to pagodas was facilitated by these diverse standards.

Shifting focus to Thai Palm Leaf Manuscripts (PLMs), the paper delved into the adaptation of IFLA's FRBR model. This modification centered on the physical content of PLMs, resulting in heightened efficiency in resource discovery, access, and management. The model effectively bridged the gap between PLMs as tangible objects and FRBR's conceptual entity notion, as outlined by Chamnongsri et al. (2006).

This study conducted a thorough examination of 'Pagoda data,' utilizing raw information sourced from both Myanmar's national libraries and academic libraries, building upon insights from prior research. The analysis comprehensively covered various dimensions, including the structure, founding details, measurements, religious significance, historical context, ritual and repair information, artifact descriptions, geographical details, and digital preservation of the pagodas. The understanding and analysis of this 'Pagoda data' are deemed crucial, particularly in the context of potential future metadata creation. Importantly, it is noteworthy that the study does not specifically focus on generating a metadata dataset. Instead, it sets the stage for future research to address the challenges and considerations associated with developing a specialized metadata dataset specifically tailored for Myanmar pagoda data.

3. Conceptual Framework

To create an effective metadata schema for Myanmar pagodas, this framework adopts a systematic approach, building on the Functional Requirements for Bibliographic Records (FRBR) Model. This model guides relationship mapping and interoperability within the schema. The framework includes a detailed comparison of data elements in metadata standards like Dublin Core, MODS, VRA Core, and CDWA, ensuring a comprehensive integration of relevant elements. Aligning the schema with practical requirements involves comparing library needs with existing metadata elements for pagoda data. The framework explores contextual aspects, considering content, context, and structural components to develop a holistic understanding, drawing insights from Baca and Gilliland-Swetland.

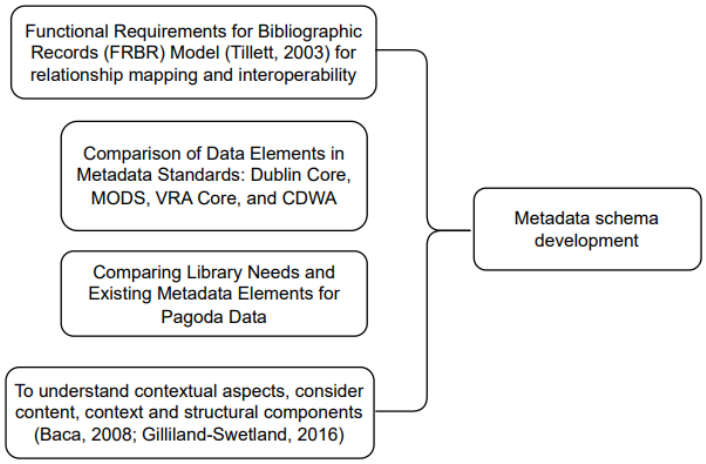

Figure 1. Conceptual Framework

4. Methodology

The earlier study utilized a mixed-methods approach to gather and analyze data related to pagoda data in a Myanmar library management system. Primary data were collected through a combination of observational studies, interviews, and surveys conducted at pagodas in Myanmar based on previous research (Pipe & Tuamsuk, 2023). Secondary data were obtained from scholarly articles, books, reports, and existing databases such as the academic research database. Content analysis was conducted to identify metadata elements, and a comparative analysis was performed to assess existing metadata standards. The study aimed to develop a comprehensive set of metadata elements tailored for pagoda data in the library system.

These are the step-by-step methods employed in this research. The initial stage of the methodology involved a meticulous examination of pagoda data elements, guided by the principles of Functional Requirements for Bibliographic Records (FRBR) as articulated by Coyle (2010) and Tillett (2003). The study analyzed existing metadata standards like Dublin Core, MODS, VRA Core, and CDWA to determine their applicability for the organizational framework of pagoda data. A comprehensive comparison was undertaken to assess how effectively the elements of the existing metadata standards for pagoda data in Myanmar's library system fulfill the requirements of libraries.

In another step, the research delved into an in-depth examination of Myanmar pagoda content, context, and structure components, enabling a profound understanding of the intricacies and subtleties inherent in pagoda data. Contextual structure analysis was employed to identify patterns and interdependencies among pagoda data elements, providing a solid foundation for metadata development.

5. Findings and Discussion

5.1 Metadata analysis of Myanmar pagoda elements with FRBR model

The metadata analysis of Myanmar pagoda elements was conducted using the FRBR model and CDWA metadata standards (Harpring, 2022). The CDWA standards were employed to accurately identify and describe the essential metadata elements. Additionally, the FRBR model's four elements (work, expression, manifestation, and item) were adapted, providing a comprehensive framework for analyzing various facets of pagoda information and establishing relationships among them. This approach facilitated a more efficient and standardized arrangement of pagoda data.

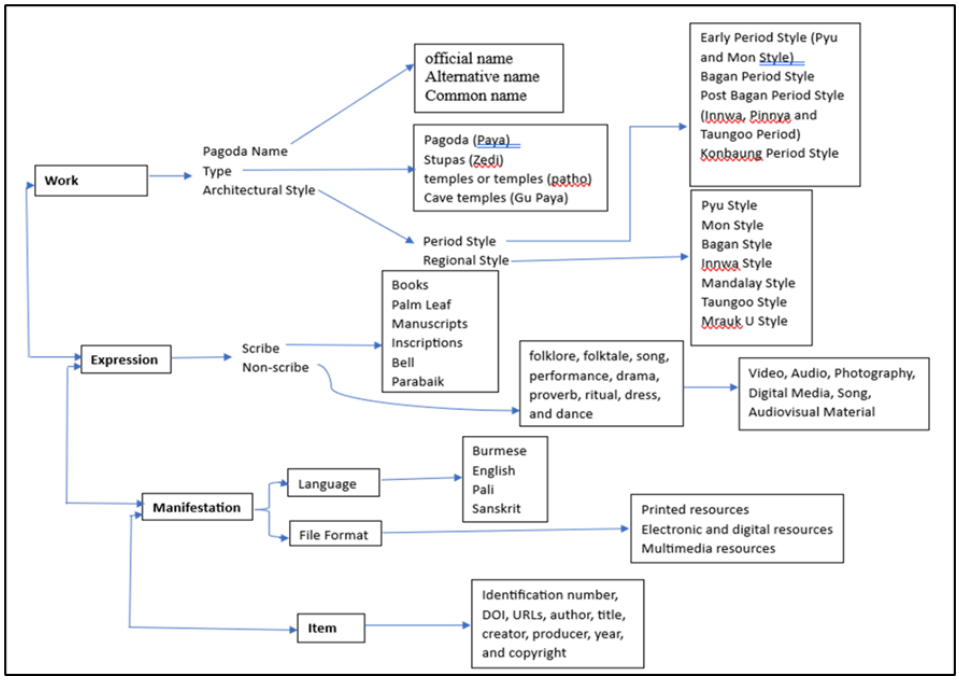

Figure 2. Analysis of Metadata Functions for Myanmar Pagoda Elements using FRBR Model Entities (Pipe & Tuamsuk, 2023)

Figure 2 illustrates the FRBR model, encompassing four organizational levels: Work, Expression, Manifestation, and Item. This model was adopted for the management of Myanmar pagoda data, incorporating diverse metadata elements at each level. The four levels provided a hierarchical structure for organizing and managing pagoda information. The Work level focused on distinguishing between different pagodas, the Expression level provided detailed information about specific pagodas, the Manifestation level specified language(s) and format, and the Item level included various resource types related to a particular pagoda.

By applying the FRBR model to pagoda information, metadata elements were organized to facilitate the discovery, use, and management of information. The Work level included elements such as name, location, and period for identifying pagodas. The Expression level included detailed elements like pagoda name, location, founding year, story, and history. The Discovery element at this level resembled the Work level, offering search options based on name, location, period, and pagoda related resources. The Manifestation level included language(s) and document objects representing the format of pagoda information. The Item level comprised various resource types like text, books, research papers, electronic files, videos, and images, allowing identification and access to specific resources related to a particular pagoda.

In summary, the FRBR model's four levels provided a comprehensive framework for analyzing different aspects of pagoda information and their relationships. Utilizing this model and including necessary metadata elements enabled the description of resources in a way that facilitates their discovery, use, and management, ultimately enhancing the user experience and satisfaction.

5.2 Analysis of Existing Metadata Standards

The research places a crucial emphasis on the analysis of metadata standards and their core elements, specifically concentrating on extracting and comparing core elements from four selected metadata standards: Dublin Core, MODS, VRA Core, and CDWA. These standards have been identified as potentially suitable for organizing Myanmar pagoda data. Dublin Core is acknowledged for its versatility, simplifying resource description and proving well-suited for cultural heritage and visual resources. Its strengths lie in ease of implementation and interoperability. MODS, an XML-based bibliographic tool, is tailored for detailed descriptions of visual resources, offering a structured approach particularly beneficial for libraries and archives. VRA Core provides a specialized framework for describing visual materials and cultural heritage, catering specifically to the needs of the visual resources community. CDWA, as a comprehensive tool for describing artworks, offers detailed and standardized representations of artistic attributes, proving valuable for art collections. The subsequent analysis underscores the practicality of Dublin Core (Kakali et al., 2007; National Information Standards Organization (U.S.), 2001; Sugimoto et al., 2002), MODS (Gartner, 2003; Guenther, 2003; Library of Congress Standards, 2022), VRA Core (Eklund, 2007), and CDWA (Harpring, 2022) in organizing pagoda data. Transitioning from individual standards, Table 1 will present a thorough examination of the strengths and weaknesses of the core elements within each standard. This analysis aims to provide valuable insights into how well these standards collectively align with the specific requirements of the metadata schema for pagoda data.

Table 1. Comparison of Data Elements in Metadata Standards; Dublin Core, MODS, VRA Core, and CDWA

Metadata Elements	Dublin Core	MODS	VRA Core	CDWA
Title	✓	✓	✓	✓
Author/Creator	✓	✓	✓	✓
Subject/Keywords	✓	-	✓	✓
Description	✓	✓	✓	✓
Publisher	✓	-	-	-
Other Contributor	✓	-	-	✓
Date	✓	-	✓	✓
Resource Type	✓	-	-	✓
Format	✓	✓	-	-
Resource Identifier	✓	✓	-	-
Source	✓	-	-	-
Language	✓	✓	-	-
Relation	✓	✓	✓	✓
Coverage	✓	-	-	✓
Right Management	✓	-	-	✓
Type of Resource	-	✓	-	✓
Genre	-	✓	-	-
Origin Info	-	✓	-	-
Physical Description	-	✓	-	✓
Abstract	-	✓	-	-
Table of Contents	-	✓	-	-
Target Audience	-	✓	-	-
Note	-	✓	-	-
Classification	-	✓	-	-
Related Item	-	✓	✓	-
Location	-	✓	✓	✓
Access Condition	-	✓	-	✓
Part	-	✓	-	-
Extension	-	✓	-	-
Record Info	-	✓	-	-
Agent	-	-	✓	-
Cultural Context	-	-	✓	✓
Inscription	-	-	✓	✓
Material	-	-	✓	✓
Measurement	-	-	✓	✓
Rights	-	-	✓	✓
Source (References)	-	-	✓	-
StateEdition	-	-	✓	✓
Style Period	-	-	✓	✓
Subject (Generic terms)	-	-	✓	✓
Technique	-	-	✓	-
Textref	-	-	✓	✓
WorkType	-	-	✓	-

Note: "✓" means the metadata element is included in the standard, and "-" means it is not included

This systematic comparison highlights commonalities and differences among the standards, aiding in the selection of an appropriate schema based on the specific needs of pagoda data description.

5.3 Comparing Library Needs and Metadata Elements for Pagoda Data

Preceding research identified the importance of including the pagoda's official name, along with any alternative or similar names, to enable users to locate the pagoda even if they were unfamiliar with its official name. The table outlined the library and library users' needs for metadata elements, such as pagoda name, location, founding year, pagoda

type, donor information, background story, characteristics, enshrined material, archeology, measurements, festival, conservation status, cataloging language, and multimedia. The discussion includes existing metadata elements for each need and proposes additional elements, such as including contact numbers in the location information for easy access by visitors and donors. The paragraph emphasized the importance of providing data on Pali, Mon, or Pyu languages through photographs, along with images of Myanmar pagodas and inscriptions, as requested by users. It highlights the essential information about building materials and techniques that may not currently be requested by library users but is necessary for researchers. To achieve consistency and standardization, it is important to use CDWA metadata that includes clear elements and sub-elements for easy categorization. The paragraph concludes by introducing Table 2, which compares library needs to existing metadata elements for Pagoda data.

Table 2. Comparing Library Needs and Existing Metadata Elements for Pagoda Data

Library Demand and Needs	Existing Metadata Elements	Discussion
Name of pagoda (including any common or alternative names)	Pagoda name, similar name, and common name	Contact numbers should be included in the location information for easy access by visitors and donors. Dates should be formatted as metadata because Burmese years are represented using both numerical and written characters
Location of the pagoda	Location and contact address	
Founding year of the pagoda	Pagoda date	
Pagoda type	Type	
Donor information	Creation	To meet user requests, it's important to provide data on Pali, Mon, or Pyu languages through photographs, along with images of Myanmar pagodas and inscriptions. Primary inscription data should be included in metadata without specific user request to serve both researchers and users. Information about building materials and techniques, which may not be currently requested by library users, is essential for researchers. Additionally, information about the pagoda preservation body and managing organization should be included in the metadata. To facilitate easier access, responsible bodies and building techniques, tools, and materials should be added to the metadata. To achieve consistency and standardization, it is important to use CDWA metadata that includes clear elements and sub-elements for easy categorization.
Background story and history of the pagoda	Ownership/ Collecting history	
Characteristics and features of the pagoda	Physical description	
Enshrined material and decorated valuable jewelry, Buddha footprints and relics data and religious artifacts and practices of pagodas	Miracles	
Archeology and tourist attraction facts	Tourist attraction fact	
	Hierarchical relationship type	
Measurements	Measurements	
	Dimensions date and shape	
	Material/Techniques	
	Material color	
Festival	(Context) Festival or ritual	
	Architectural context	
	Style/Period	
Conservation status of the pagoda	Conservation/Treatment history	
	Treatment type, Treatment agent, Treatment date, Earliest date, Latest date, Related visual things (Mural)	
	Inscription author, Inscription location, Inscription language, Inscription date	
Cataloging language (Myanmar and English)	Cataloging language	
	Related person/Corporate body	
	Related textual reference	
Multimedia	Image and video	

To effectively manage Pagoda data, a metadata design capturing its specific characteristics in Myanmar is crucial. This involves considering the unique content, context, and structural components of pagoda data, along with cultural and religious aspects (Table 3). The aim is to facilitate the discovery, use, and management of Pagoda data through the incorporation of these specific elements.

Table 3. Myanmar pagoda content, context, and structure components

Module	Elements
Content	Buddha image and other related statues, enshrined material, related thin inscription, mural, replica pagoda or Buddha image, construction mate and things in the pagoda compound.
Context	pagoda name, founding date, renovation and preservation date, collap date, hti (finial) mounting date, creation, creator, style/period, measureme and historical dimension, pagoda color, type and history, arts a architecture, decoration, festival, location and contact address, ownersh historical descriptive note, related history, physical description, mira tourist attraction facts, inscription language, responsible body, measureme deity, famous and mysteries things, ritual information, pagoda author former caretaker.
Structure	descriptive note, abstract, damage and conservation history, related histo pagoda number, inscription information, reference, media or online resour

The metadata development process commenced with an analysis of FRBR components, including content, context, and structure, alongside a review of existing metadata elements related to cultural heritage. To establish a robust framework, CDWA and VRA Core elements were selected, drawing on library metadata standards. Adjustments were made to certain elements based on library-demanded data and research findings, ensuring alignment with Myanmar pagoda information.

6. Conclusion and Discussion

The study's findings identified metadata elements that align with CDWA (Categories for the Description of Works of Art) metadata standards, with the suggestion to incorporate VRA Core (Visual Resources Association Core) standards for photographs and videos of pagodas. However, the quest for a comprehensive metadata schema for Myanmar pagodas warranted consideration of additional elements. This research significantly contributes to the field by offering a framework tailored specifically to the nuances of Myanmar pagodas. The study approached efficient pagoda data management in Myanmar's library system through a phased methodology. Future research endeavors will involve metadata elements evaluation and validation through expert input.

7. Limitation

This study focuses on analyzing information and features related to pagodas, intentionally avoiding direct involvement in creating metadata schema for pagoda data. Additionally, it doesn't explore how pagoda data is used in Myanmar libraries.

8. Recommendations

The study's findings recommend a collaborative approach for metadata implementation, emphasizing the transformation of pagoda data elements into organized metadata that aligns with the specific needs of libraries. As a recommendation for future research, there is a proposed plan to categorize elements into core components and sub-elements. This strategic approach aims to establish the foundational framework necessary for developing a comprehensive metadata schema. These elements are precisely defined, detailing format styles and supported by illustrative examples. Importantly, aligning metadata elements with the specific requirements of Myanmar libraries stands out as a crucial aspect of the upcoming process.

Furthermore, there is a strong recommendation to foster collaboration among libraries, cultural institutions, researchers, and government bodies based on the study's outcomes. This collaborative effort is essential for establishing a unified platform dedicated to preserving and sharing Myanmar's cultural heritage. Creating a shared repository or network tailored specifically to pagoda data and other cultural artifacts becomes instrumental in facilitating the exchange of metadata, resources, and expertise among stakeholders. By expanding the repository's scope to encompass both tangible and intangible artifacts, a comprehensive platform is established, benefiting researchers, scholars, and enthusiasts. This collaborative initiative not only enhances access but also significantly contributes to the preservation and deeper understanding of Myanmar's pagoda data.

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