Designing an Extended BIBFRAME Bibliographic Structure for Describing Old Materials

Minjung Park[1,†] and Seungmin Lee[2,†]

[1] *Chung-Ang University, 84 Heukseok-ro, Dongjak-gu, Seoul, South Korea*
[2] *Chung-Ang University, 84 Heukseok-ro, Dongjak-gu, Seoul, South Korea*

Abstract

Currently, many countries are revising their cataloging rules based on the Resource Description and Access (RDA) standard. In this process, however, there has been insufficient discussion regarding the representation of the unique bibliographic characteristics of old materials. This study examines the bibliographic elements necessary to describe the distinctive bibliographic characteristics of old materials. It also proposes an approach to incorporating these elements into bibliographic data creation by extending the bibliographic structure of BIBFRAME. By moving beyond traditional unit record approaches, this extended BIBFRAME-based structure can facilitate the semantic linking of bibliographic values inherent in old materials.

Keywords

BIBFRAME, RDA, DCRMR, cataloging rules, old materials

1. Introduction

Old materials have unique bibliographic characteristics that differ significantly from those of general resources. These include the re-publication of identical content in various formats and a wide temporal span of publication ranging from historical to modern times. In particular, Korean old materials exhibit structural and physical forms that are totally different from those found in modern publications. Therefore, it is necessary to have a bibliographic structure that can fully reflect and implement these distinctive bibliographic characteristics to generate precise bibliographic records and enhance the management of those resources.

However, current cataloging rules and metadata standards face limitations in accommodating these characteristics, resulting in challenges in accurately describing old materials. Furthermore, institutions holding old material collections have adopted heterogeneous cataloging rules, which hinder the interoperability of bibliographic records across institutions.

To address these challenges, this study proposes a more flexible and extensible bibliographic framework that enables modular data segmentation and interlinking. Accordingly, this study proposes an extended BIBFRAME-based metadata structure that reflects the conceptual and

* Corresponding author.
† These authors contributed equally.
mj3153p@naver.com (Minjung Park); ableman@cau.ac.kr (Seungmin Lee)
0009-0008-8939-307X (Minjung Park); 0000-0001-6516-8961 (Seungmin Lee)

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descriptive specificities of old materials. It can also provide semantically enriched representation and supports their effective management, interlinking, and utilization of old materials.

2. Theoretical background

2.1. Significance of old materials

Old materials are defined differently across countries, yet they share a common significance. They serve as social assets for the long-term preservation of information that may otherwise be lost over time, thereby ensuring the communication of their value to future generations. These materials are also significant not only due to their historical context of works, publication, or transcription, but also because of their limited availability, distinctive physical bindings, and cultural heritage value. Moreover, through the process of bibliographic analysis and annotation, old materials facilitate research into the past and contribute to the continuity of knowledge across past, present, and future generations.

2.2. Limitations of current cataloging rules for old materials

Old materials in Korea are currently dispersed across various institutions, each employing different cataloging rules. Among the cataloging rules used to describe such materials are the Korean Cataloging Rules (KCR), the Old Book Cataloging Rules, and the KORMARC Format for Old Books. These diverse and institution-specific use of cataloging rules are mostly based on a fixed, unit record format when creating bibliographic records for old materials. Consequently, even for identical old materials, it is often difficult to exchange bibliographic records among institutions.[1] Moreover, this unit record-based approach restricts the representation of bibliographic relationships at the record level, resulting in limited semantic interlinking across bibliographic data.

2.3. DCRMR as a cataloging standard for old materials

An international RDA-based cataloging standard for describing old materials, Descriptive Cataloging of Rare Materials (RDA Edition) (DCRMR), was officially released in February 2022.[2] However, DCRMR lacks elements necessary for describing bibliographic characteristics unique to East Asian, particularly Korean old materials, including edition type, block carving style, line rulings, and textual endings. In addition, DCRMR shows several limitations in adequately representing the detailed bibliographic characteristics of Korean old materials. Therefore, this study proposes a bibliographic description structure optimized to the Korean old material context, built upon the foundations of RDA and DCRMR. To enable its practical application in bibliographic data creation, the study further suggests an extension of the BIBFRAME structure.

3. Bibliographic structure for old materials

3.1. Descriptive elements for old materials

To identify the bibliographic elements that can represent the unique characteristics of Korean old materials, this study extracted relevant descriptive elements based on existing cataloging

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standards, including the KCR and the KORMARC Format for Korean Old Materials. The extracted elements were then categorized according to their common features: ‘common descriptive elements’ and ‘specialized for old materials.’

The ‘common descriptive elements’ is further divided into two element categories: ‘shared elements’ and ‘additional elements.’ ‘Shared elements’ can be applied to both general materials and old materials, whereas ‘additional elements’ means those requiring additional rules when applied to old materials. As a result, this research extracted 23 ‘specialized elements for old materials, 14 shared elements, and nine additional elements. Among these elements, the common elements are already covered by existing cataloging rules for general material types.

3.2. Structure of relationships among entities

IFLA defines 36 relationships (excluding inverse relationships) among the 11 entities in the LRM.[3] Based on these relationships, this study established a set of bibliographic relationships optimized to the description of old materials. This relational structure is designed to sufficiently represent the unique bibliographic relationships in old materials context and to facilitate efficient linking of related resources. However, the proposed structure focuses on the relationships among the nine primary LRM entities, excluding the two lowest-level entities, *Person* and *Collective Agent*.

The entity relationships for describing old materials are categorized into five relationship groups: relationships among WEMI entities, relationships between WEMI and Agent entities, relationships between Nomen and Agent entities, relationships involving the Place entity, and relationships involving the Timespan entity. This framework not only reflects the standard relationships among LRM entities but also facilitates the interlinking old materials and related resources at the bibliographic record level (see Figure 1).

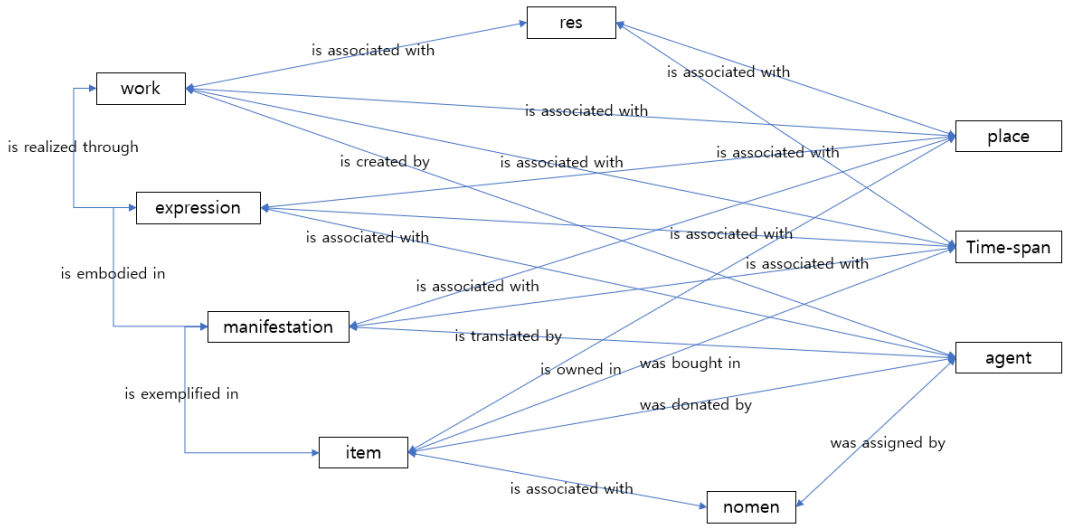

Figure 1. Integrated bibliographic relationship structure for old materials

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3.3. RDA-based descriptive structure for old materials

To ensure the extracted elements can be effectively applied to old materials, a structured bibliographic framework must be established. Accordingly, a bibliographic structure was constructed based on RDA and the Library Reference Model (LRM). To align the descriptive elements of old materials with the LRM framework, the elements were then further grouped according to LRM entities. For example, content-related elements such as literary format and language were classified and mapped to the entity Expression within the LRM structure (see Figure 2).

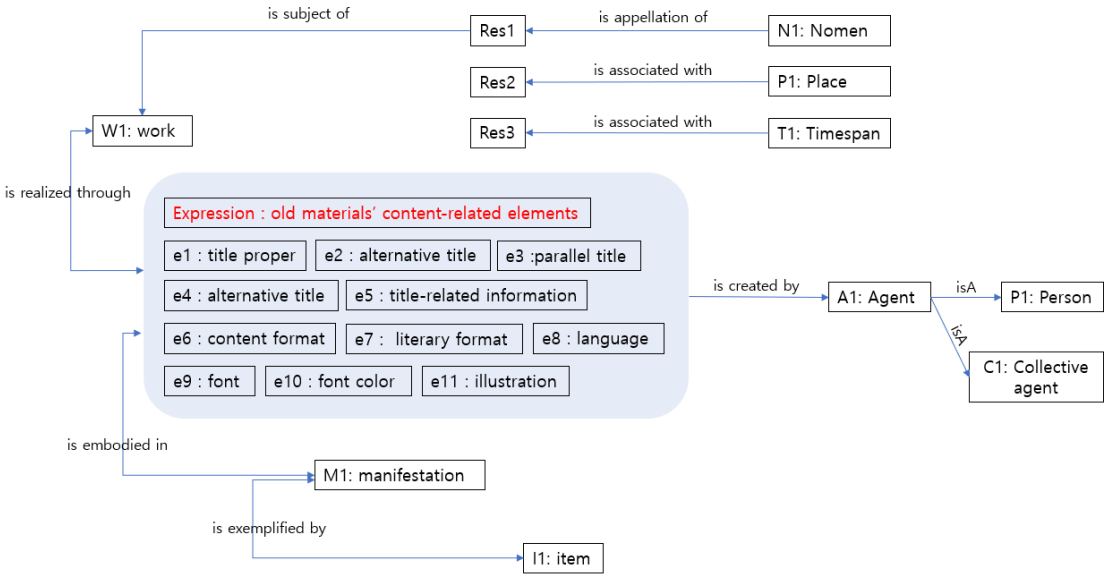

Figure 2. Content-related elements of old materials

Similarly, format-related elements of old materials were mapped to the entity Manifestation, while statement of responsibility-related elements were assigned to the entity Agent. Elements related to place and time, such as place of publication, place of distribution, year of publication, and year of distribution, were associated with the entities Place and Timespan, respectively.

Figure 3 illustrates the FRBR LRM structure based on the grouping of these descriptive elements. To facilitate understanding of the specific attributes and relationships within the RDA-based LRM model, the structure is exemplified using the historical text *The Lotus Sutra*.

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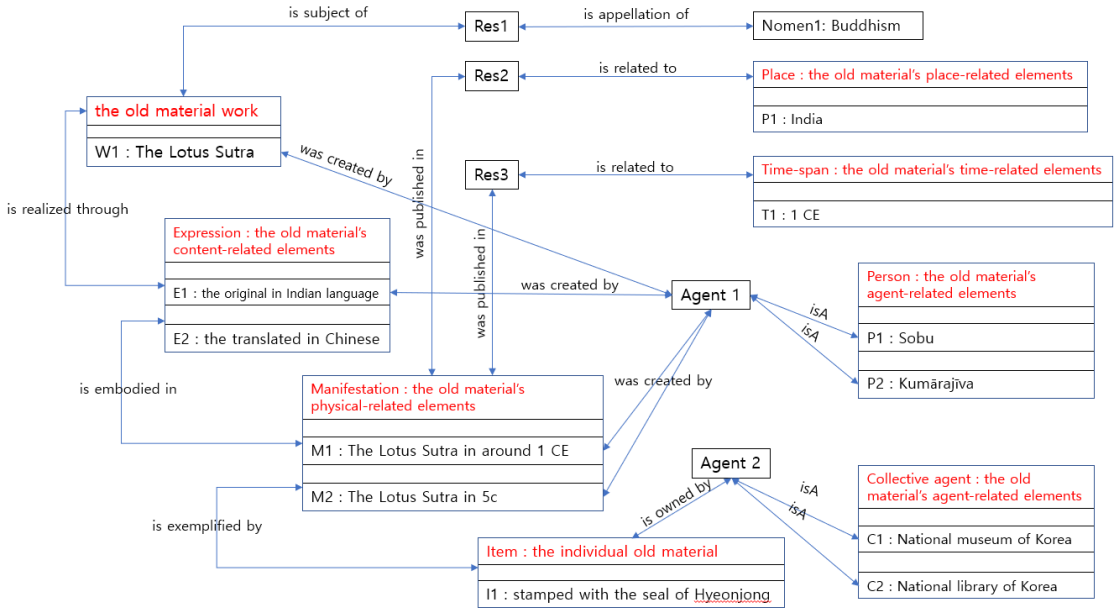

Figure 3. Grouping of descriptive elements in LRM

3.4. Implementation of RDA-based descriptive structure

To assess the applicability of the proposed bibliographic structure, it was applied to the case of the *DonguiBogam*, a representative example of classical literature characterized by diverse bibliographic features and historical contexts. The RDA-based framework enables the systematic linking of various manifestations and editions that preserve the intellectual content of the original work, including contemporary reproductions in different forms.

The original work of the *DonguiBogam* can be categorized into different expressions based on the language of transcription, and further differentiated into specific manifestations depending on the physical formats realized. In this context, bibliographic entities can be described in relation to agents, place, and time-span, corresponding to each resource. The results of applying these bibliographic characteristics and relationships to the proposed framework are shown in Figure 4.

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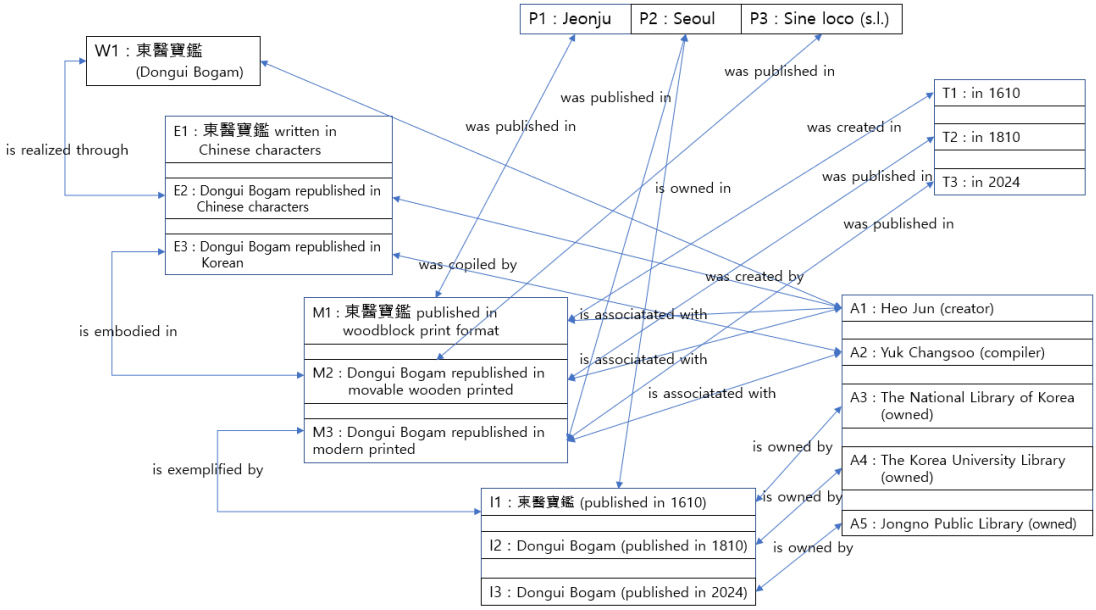

Figure 4. Integrated bibliographic relationship structure for *DonguiBogam*

4. Conclusion

This study proposed a set of bibliographic elements specifically for describing old materials and organized them into groups based on shared characteristics. The elements were further categorized according to content, physical form, statements of responsibility, and spatiotemporal attributes, and were mapped onto the LRM structure. This approach enables the construction of a modular bibliographic structure that facilitates the interlinking of old materials dispersed across multiple institutions.

By moving beyond traditional unit record-based cataloging and applying RDA-based cataloging principles, the proposed framework allows for the semantic representation of the bibliographic value of old materials and supports meaningful linking with related resources. Furthermore, it can lay the foundation for generating bibliographic data in BIBFRAME format, thereby enabling integration into linked data environments.

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Building upon the author's master's thesis, this paper expands the previously proposed conceptual structure and proposes an approach for its practical implementation in substantial bibliographic data.

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