"REIMAGINING METADATA AND KNOWLEDGE BODY FOR IMPROVED LIBRARY SEARCH"

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Abstract :

Libraries are transitioning from traditional collection-centric systems to interconnected user-centric search environments. In this transformation, metadata and knowledge organizations play a crucial role in connecting to various library resources, improving searches, and enabling users to overcome organizational and technical silos. Traditional bibliographic archives, classification systems, subject headings, authority files, and catalog databases are primarily designed for a managed library environment. However, the development of digital repositories, institutional repositories, electronic resources, open educational resources, and web-based information has led to the need for interoperable, linked, and machine-readable metadata.

This article examines the changing role of metadata and knowledge organization in modern library search systems. Mark supports the transition from various metadata documents to interconnected knowledge frameworks through standards and methodologies such as Dublin Core, RDF, Linked Data, Bibframe and IFLA Library Reference Model (LRM). IFLA LRM provides a comprehensive conceptual model that supports bibliographic data in a linked data environment, while Bibframe provides a link database framework for bibliographic descriptions, exploring migration routes away from the MARC-based environment.

This article also explores semantic relationships, authority control, subject vocabulary, ontology, and how persistent identifiers can enhance the search and connection of people, tasks, topics, organizations, and resources. They believe that future library searches will lead to knowledge discoveries only related to document searches. The conclusion of the article is that libraries should adopt interoperable metadata systems, strengthen knowledge organization skills, integrate emerging technologies, and put users at the center of metadata generation and innovation.

Keywords : Metadata; Knowledge Agency; Linked Data; Library Search

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Introduction :

Libraries have traditionally organized information through cataloging, classification, index of materials, and authority control. This process has made it possible for users to identify, locate, and retrieve information resources in an organized manner. For decades, library catalogs have been the primary means for users to interact with bibliographic

information. Library collections have been given stability and structure by applying standards established in traditional cataloging methods, classification schemes, subject headings, and bibliographic descriptions.

However, the information environment has changed drastically with the development of digital libraries, institutional repositories, electronic databases, multimedia collections, research information systems, and web-based resources. Academic libraries today handle information in a variety of formats and on many platforms. A single entity can provide available printed books, e-books, e-journals, research papers, digital archives, institutional publications, and open-access resources. These resources are individually valuable, but their full potential can only be realized when they can only be discovered and connected by different systems.

In traditional library systems, metadata often exists in separate databases and organizational systems. A book can be described in a catalog record, an institutional repository may contain research papers of the same author, and a digital archive may contain another description of the relevant intellectual work. Although these resources have a strong relationship with each other, these relationships are not always visible to the user. This distinction can create metadata silos, where information is limited to individual databases, collections, or platforms.

Metadata can affect the silo search experience in several ways. Users may need to search multiple systems to track relevant information, but the same author, subject, or organization may be represented differently in a database. Differences in names, subject words, formats, and descriptive methods make it difficult to identify relationships between resources. With the increasing volume and diversity of digital information, documenting more metadata is not enough. Libraries should consider how these documents can be connected, shared, interpreted, and reused.

That's why the topic "From Silo to Synthesis" provides an important framework for rethinking metadata and knowledge organization. The concept of synthesis suggests going beyond different details and moving into an environment in which different information resources can be connected through meaningful relationships. Instead of treating metadata as a collection of separate bibliographic documents, libraries can use metadata as a mechanism to add resources, people, topics, organizations, concepts, and collections.

This transformation is closely related to the development of Linked Data and Semantic Web technologies. The linked data provides the possibility of presenting information not as a separate document but as an interconnected entity. In such an environment, the writer can be connected to action, work can be linked to topics, topics can be linked to related concepts, and institutions can be connected to researchers and research results. Such connections can create a rich search environment in which users can move from one information resource to another through meaningful connections.

This transformation has been attributed to the development of conceptual models for bibliographic information. The IFLA Library Reference Model (LRM) shows a significant

development in this direction. It integrates previous FRBR, FRAD, and FRSAD conceptual models into a composite conceptual model and is designed with contemporary bibliographic environments and linked-data applications in mind. This model encourages libraries to understand bibliographic information from units and relationships rather than just traditional records.

Similarly, developments such as Bibframe (Bibliographic Framework) represent an important step towards linked data-based bibliographic interpretation. Bibframe seeks to provide a foundation for bibliographic descriptions in a network environment and provides a way to present bibliographic information as interconnected information. These developments indicate that the future of library metadata is gradually moving from record-centric descriptions to unit-based and relationship-based information management.

Knowledge institutions also play an important role in this transformation. Classification projects, subject names, essays, classifications, certification files, and oncology have traditionally helped libraries organize information according to an established intellectual framework. In a connected digital environment, this knowledge can be further enhanced through body recognizable tools, machine-readable vocabulary, and semantic relationships. This helps explain how the library system relates not only to resources but also to other resources and concepts.

For example, a traditional catalog search for "artificial intelligence" may list books and articles with the word "intelligence." A more connected search environment can establish connections in artificial intelligence, machine learning, deep learning, data science, robotics, ethics, and other related concepts. Similarly, author search can lead users to the author's work, organizational relationships, research areas, related researchers, and related topics. This type of approach changes the nature of the search from just looking for documents to finding relationships and knowledge.

The importance of this change in interdisciplinary research is even greater. Researchers work more within the boundaries of traditional content and seek out information from a variety of topics, collections, and platforms. The added metadata helps in collecting resources that can be kept separate from organizational or disciplinary silos. In this context, metadata is not just a descriptive tool but also an important tool to support interdisciplinary research and research.

Another important thing is that there is a growing expectation that library data should be visible outside of traditional library management methods and should be able to be reused. Libraries are part of a broader information ecosystem that includes universities, research institutes, publishers, repositories, cultural institutions, and the open web. Interoperable metadata allows library resources to participate more effectively in this broader environment. This will enhance the visibility of library collections and create new opportunities for resource exploration and reuse.

Also, the transition of linked metadata creates a number of challenges. Libraries have a large number of heritage bibliographic records, many of which are designed according to

outdated standards and practices. Differences in metadata structure, content terminology, authorization control, and data quality can make integration difficult. It also faces challenges related to technical infrastructure, staffing, frequent identification, data governance, and long-term management.

Finally, the paper states that the future of library discovery depends not only on the quantity of information provided by libraries, but also on the quality of the relationships in that information. The speed of synthesis in silos allows libraries to transform their collections into knowledge environments related to various documents that support more effective discovery, research, and learning.

Metadata in a Changing Library Environment :

Metadata can be broadly understood as structured information that describes, identifies and provides access to an information resource. In a library, metadata can include titles, authors, publishers, subjects, classification numbers, languages, dates, formats, identifiers, and relationships to other resources.

Traditional library metadata is primarily document-based. A bibliographic document describes a specific resource in a framework field. Standards such as MARC play an important role in the creation and exchange of bibliographic documents.

However, in the modern information environment, metadata is required to work outside of individual documents. The search system is expected to include relevant books, authors, topics, editions, formats, reviews, research results, and other information items.

Find Knowledge Institutes and Libraries :

Knowledge organization includes the processes and systems used to represent, create, and communicate information resources. The main tools include:

- Classification scheme
- Topic Title
- Theoretical
- Classification[edit]
- Authentication files
- Oncology
- Controlled Dictionary[edit]
- Knowledge Graph
- Semantic relationships[edit]

These tools provide a framework for large collections and help users find information through multiple channels.

For example, a traditional catalog may allow users to search for a book based on its title or author. The knowledge-based search environment can connect writers to other works, topics, relevant persons, organizations, editions, and formats.

This shifts the role of the library's catalog from a bibliographic to a knowledge-seeking environment.

From metadata silos to metadata synthesis :

Metadata silos occur when descriptive information is limited to individual systems, databases, or collections. For example:

- Library Catalog Metadata
- Corporate Repository Metadata
- Digital Library Metadata
- E-resource metadata
- Revision Publication Metadata
- Archives and Special Archives Metadata

The main challenge is not only the existence of metadata, but also the inability of the system to understand and connect metadata in all environments.

The purpose of metadata synthesis is to solve this problem by collecting different types of metadata and establishing meaningful relationships between the elements.

The Role of Linked Data :

A linked data library provides an important technical foundation for adding metadata. Rather than treating the data as a separate document, the linked data shows the elements and their relationships in a machine-readable format.

The Library of Congress describes bibframe as the basis for bibliographic descriptions on the web and in a broader network environment using linked data technology.

Bibframe presents bibliographic information through functions, examples, and elements of objects, and moves toward a more contextual-based representation of bibliographic information.

This method helps libraries to:

- Get in touch with relevant sources.
- Reusing metadata.
- Reduce repetition.
- Improving semantic search.
- Collect external datasets.
- Support machine-readable metadata.
- Increase interoperability.

IFLA LRM and Knowledge Institute :

The IFLA Library Reference Model (LRM) is particularly important for the future of bibliographic data. It provides a high-level conceptual model that integrates previous FRBR, FRAD, and FRSAD models into a single framework.

The LRM is designed to display bibliographic information only through separate notes based on units and relationships. Their approach to the linked data environment is linked to the development of future search systems.

Given the continued evolution of LRM-related models, it seems that library metadata is moving rapidly towards interoperability and semantic representation. The current standards of IFLA include LRM and LRMU.

Semantic Search and Knowledge Graph :

The next generation of library search systems can use semantic relationships to deliver a richer search experience.

Digital Resources :

This method transitions from finding documents to finding relationships.

A knowledge graph can support this process by showing the elements in a structured network and their relationships. It will be particularly useful for digital humanities, institutional repository, research innovation and interdisciplinary fellowship.

Authority regulation and interoperability :

Authority control Knowledge is an essential component of an organization. Split search results can be generated by a person's name, organization, or different types of text.

Challenges :

- Legacy Metadata
- Quality of metadata
- Interoperability
- Lack of Skills
- Costs and Infrastructure
- Multilingual and Multicultural Representation

The Emerging Role of Artificial Intelligence :

Artificial intelligence supports the generation of metadata and helps knowledge organizations by:

- Automatic text assignment
- Unit ID card of the name
- Increasing metadata
- Classification Information
- Duplicate Detection
- Adding Components
- Automated Abstract Production
- Multilingual metadata structure

- Recommendation Method

However, AI-generated metadata should not completely replace business decisions. Librarians are important for quality control, ethical judgment, authority management, cultural representation, and scrutiny.

Therefore, the model of the future should be:

AI-Assisted Metadata + Librarian Skills + User Feedback

A fully automated metadata structure instead.

Rebuilding Library Search :

The library search system of the future should go beyond the traditional search box model. The newly created search environment should provide for:

Integrated Collection ↓
Interoperable Metadata ↓
Components and Relationships ↓
Semantic Conservation ↓
Knowledge Graphs ↓
Personal Search ↓
User-Centered Knowledge Search

Such systems can bring print, electronic, digital, archival and organizational resources into a unified search environment.

The ultimate goal is not only to help users find documents, but also to help them understand the information landscape around that document.

Conclusion :

The change in knowledge added by metadata silos represents a fundamental change in the structure of libraries and the way they access information. Metadata is no longer a descriptive component of catalog documents. It is becoming an integrated infrastructure that allows collections, people, themes, concepts and services to come together.

IFLA LRM and Bibframe represent a move to a unit-based, relationship-based, and related data-enabled bibliographic environment.

For libraries, the future of innovation lies not in isolation but in synthesis. By combining high-quality metadata, knowledge organization, authority control, semantic technology, linked data, and AI-assisted enrichment, libraries can create a more interconnected, intelligent, and user-centric innovation environment.

The role of the librarian evolves primarily from creator and manager of bibliographic documents to designer, curator, and quality controller of interconnected knowledge structures.

In the end, the journey from "silo to synthesis" is not just a transformation of technology. It's a change in the philosophy of library searches, which ranges from helping users find personal resources to finding relationships, references, and knowledge.

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