KNOWLEDGE DISCOVERY SYSTEMS: RE-IMAGINING LIBRARY SERVICES AND DISCOVERY FROM SILOS TO SYNTHESIS

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Abstract :

Educational libraries have traditionally provided access to information through catalogs, book databases, classification systems, and text-based collections. These systems have played a key role in helping users find information, but the rapid development of digital resources has created a more complex search environment. Books, journals, research papers, enterprise repositories, databases, digital archives, and open access resources are generally distributed on a variety of platforms. As a result, users need to explore many systems before finding the information they need for their educational or research work.

Knowledge search systems offer an opportunity to bridge this gap by combining information resources, metadata, relationships, and research services in a more integrated environment. Modern search systems can combine multiple sources and provide an interface for users to search for and discover different collections. Therefore, the growth of research services has led libraries to focus on creating intellectual environments associated with the creation of various information systems.

This article explores the concept of knowledge search systems in educational libraries and their role in transforming library service information. It discusses the importance of metadata, interoperability, federated and integrated search, compliance ranking, semantic relationships, connected data, knowledge maps, and user-centered interfaces. The article also identifies key challenges such as metadata distortion, system interoperability, digital-resource fragmentation, technological infrastructure, and information load. Proposes a user-centric model to create a knowledge-based environment that connects storage, services, and users. The paper states that the future of library innovation lies not only in finding more resources, but also in creating meaningful relationships between resources, concepts, and users.

Keywords : Knowledge Discovery Systems; Library Discovery; Metadata; Information Retrieval

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----------Introduction :

The library always helps users find and access information. In a traditional library environment, catalogues were the primary research tools. Users search for books and other library items by authors, titles, texts, and classification-based methods.

The digital transformation of libraries has significantly improved the information

environment. Academic libraries now offer printed books, e-books, electronic journals, research databases, institutional repositories, digital archives, articles, articles, and open access resources. These resources are often hosted on different platforms and managed by different systems.

This has created a new problem. Libraries make more information available than ever before, but sometimes it's very difficult to find the right information.

The student should search for a library catalogue for books, a separate database of journal articles, an institutional repository for articles, and an external search engine for open access materials. The information is available, but it is divided into different information silos.

The concept of a knowledge search system offers a possible solution to this problem. Instead of treating each repository as a separate information environment, the search system seeks to consolidate resources and provide users with a more integrated path to knowledge.

This approach closely aligns with the broader changes outlined in "From Individual to Collection: Revisiting Library Collections, Services, and Innovation."

Concept of Knowledge Search System :

Knowledge search systems in libraries can be understood as an integrated technological environment that enables users to identify, retrieve, connect, and search for information from a wide range of collections and sources.

The traditional research process can be summarized as follows:

Results → User→ List → Collection

The digital search process can be described as follows:

The results of the user's knowledge→ the search system → the search results → several sets of relevant results→

The second model offers a comprehensive search experience because users are not limited to collections or databases.

Therefore, acquiring knowledge is more than acquiring information. Data recovery mainly focuses on finding relevant documents. The pursuit of knowledge also considers the relationship between documents, lessons, authors, concepts, and other factors.

Development of Library Research :

The search for the library went through several stages.

Step 1: Card list

Traditional card lists provide access through physical documents, including authors, topics, and lessons.

Phase 2: OPEC

Online public access lists replace physical cards and allow users to search library records electronically.

Step 3: Search the database

The development of electronic journals and bibliographic databases created a unique environment for research on a variety of topics.

Step 4: Federal Discovery

Federated Search attempted to find multiple databases through a common interface.

Step 5: Discovery Service

Modern search systems integrate large amounts of metadata documents and provide a search interface.

Step 6: Cognitive research

The emerging direction is not only access to documents, but also with systems that connect resources through metadata, semantic relationships, identities, and knowledge structures. This development gradually shifts from an isolated research to a comprehensive one.

Teaching Information in Educational Libraries :

Data silos are when storage or information systems operate independently and users cannot easily access the relationships between them.

Common examples:

- Library Catalogue
- E-Journal Database
- E-book site
- Enterprise Repository
- Digital Library
- Collection of Articles
- Special Collections
- Open Access Resources
- Edit Database

Each system may contain valuable information, but additional research efforts are needed to isolate these resources.

For example, a researcher who studies climate change and agriculture wants information about topics such as the environment, agriculture, economics, geography, and public policy. If these resources are separated by database or subject series, researchers have to go through multiple systems.

The context of the quest for knowledge seeks to bridge this gap.

Salient Features of Knowledge Search :

Integrated metadata :

Supports metadata research. Titles, editors, contents, publication information, identification, and related searches help organize and retrieve system resources. Static metadata allows you to collect information from different collections.

Unified search interface :

A search interface reduces the need for users to navigate between multiple databases and sites.

Core Search Table :

A digital search service can generate a large searchable code that includes metadata from multiple sources. It allows users to access a variety of resources from a common search environment.

Sustainability Ranking :

The results of the research should be presented consistently rather than alphabetically or chronically. Consistency ranking helps users quickly identify useful resources.

Fested navigation :

This feature allows users to limit the results to parameters:

- Compiler
- Subject (content)
- Date
- Default Type
- Language
- Light
- Visible Objects
- Shops

Fested navigation is very useful when generating great search results.

Meaningful relationships :

The quest for knowledge is strengthened when the system recognizes the relationships between ideas.

For example:

Artificial Intelligence → Machine Learning → Deep Learning

or

Author→ Library Resource → Edition→ Works

Such relationships can provide users with additional research opportunities.

The Role of Metadata in the Quest for Knowledge :

Metadata is an important foundation of a search system.

The result of low metadata is:

- No search results found.
- Duplicate Document
- Invalid text entry
- Inappropriate author name
- Difficulty in identifying sources

On the other hand, high-quality metadata supports the relationship between recovery and resources.

Therefore, the success of a search system depends not only on its software, but also on the quality and relevance of the metadata behind it.

Libraries should focus on indexing criteria, content access, authentication control, identifiers, and metadata interoperability.

Explore and find out :

There is an important difference between research and research.

Research begins with the need for commonly known information.

For example:

"I want an article on artificial intelligence in education.

This research may go beyond the initial conclusions.

Users will receive the following:

Machine Intelligence :

→ Machine Learning→ Educational Technology→ Educational Analytics→ Educational Psychology→ AI Ethics → Digital Education

In this way, search users can create new lines of data that they didn't initially consider.

This is very important for research as scholars will solve their problems when new information becomes available.

Knowledge Maps and Semantic Research :

The knowledge map provides the opportunity to provide information in the form of organizations and relationships. In a library environment, knowledge map writers can include text, fields, institutions, sites, research projects, and collections.

This library can transform the research process into a network of knowledge associated with a list of research results.

The Role of Artificial Intelligence :

Artificial intelligence supports the pursuit of knowledge in many ways.

This will help:

- Searching for natural language
- Query Extension
- Automatic text recognition
- Related Basic Recommendations

- Unit Identification
- Duplicate Search
- Optimizing metadata
- Personal Search

For example, instead of asking users to search for more specific lists, an intelligent search system can define natural language issues and identify relevant concepts.

However, instead of changing the capabilities of a professional library, AI should be supported. Librarian metadata quality, resource assessment, ethical considerations, and information literacy are important.

Exploring user-centered knowledge :

A successful search system needs to be built around user behavior rather than library structure.

Users often do not think about the following:

In which database is this information located?

In this context he thinks:

Where can I get reliable information about my content?

Therefore, unnecessary technical trouble should be hidden in the research context.

A user-centric system should provide the following:

- Simple search
- Advanced research if needed
- Explain the results
- Application Filter
- Related Resources
- Recommendations
- Mobile-friendly access
- Accessibility Feature

The aim should be to bridge the gap between user issues and relevant information.

Exploring Knowledge and Library Services :

Knowledge search systems can affect many traditional library services.

Reference Service :

Librarians can identify resources from multiple collections using research tools and provide more comprehensive contextual support.

Basis of research :

Researchers can browse the content in different categories and identify relevant research more effectively.

Data Literacy :

Students can learn how to combine different sources of information and evaluate research results.

Improvement of Savings[edit] :

Using the search method helps the data library identify high-demand content and storage gaps.

Enterprise Repository :

The results of the search are more visible when the repository documents are integrated into a broader search environment.

In this way, search technology contributes to the transformation of library services as a whole.

The Challenge of the Knowledge Seeking Method :

Despite their advantages, knowledge-seeking systems face many challenges.

Metadata Difference :

Different databases can use different metadata structures and content vocabulary.

Mobility :

Systems created by different vendors cannot communicate effectively with each other.

Duplicate Document :

A proof can come from multiple sources, which can lead to fabricated or confusing conclusions.

Original Registration :

The search system can identify a source without guaranteeing that the user has access

to their entire content.

Plenty of data :

Integrated research creates a compilation of several key findings.

Technical Infrastructure :

Skilled technical assistance is required for the implementation and maintenance of research services.

User Training :

Users may need more guidance to understand the advanced search feature and evaluate the results.

Conclusion :

The evolution of digital information has changed the traditional library research environment. Libraries now offer access to large and varied collections, but these resources are often divided into multiple systems. As a result, data silos can complicate unnecessary research for students and researchers.

Knowledge systems provide an opportunity to bridge this gap. By combining storage, metadata, and search services, libraries can create a more connected information environment. Technologies such as integrated coding, semantic interactions, knowledge mapping, and artificial intelligence can further enhance the research experience.

But technology alone cannot solve this problem. High-quality metadata, interoperability, business acumen and consistent evaluation are equally important.

So the future of library research needs to move away from the question of "Where is the information?" and "How is this information connected, and how will users find it?" You have to pay attention to that.

The move from standalone to package marks a major shift in library services. The library of the future will not only provide access to individual collections, but will also provide them. It creates collections, resources, opinions, and relationships between people, allowing users to gain knowledge from searching for information.

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