

## Chapter XXVII

# Metadata and Metaphors in Visual Interfaces to Digital Libraries

Ali Shiri

*University of Alberta, Canada*

### ABSTRACT

*This chapter introduces a new category of digital library user interfaces called metadata-enhanced visual interfaces. Drawing on the earlier information retrieval visual interfaces that have made use of thesauri, this chapter will review and analyze metadata-enhanced visual interfaces to digital libraries based on two key variables, namely metadata elements used for visualization purposes and visual metaphors incorporated into the user interfaces. The aim of this study is to inform the design of visual interfaces for digital libraries through bringing together issues that have roots in such communities as information retrieval, digital libraries, human-computer interaction, and metadata. The findings of this study provide design ideas and implications for digital library interface design in terms of the various metadata-based information search and retrieval features for visualization purposes.*

### INTRODUCTION

Digital libraries are multifaceted and complex information structures that offer a wide range and variety of information-bearing objects. They vary in their content, subject matter, cultural characteristics, language, and so forth. Arms (2000) notes that “a digital library is only as good as the interface it provides to its users.” The variety of

digital objects and materials in a digital library poses challenges to the design of usable and easy to understand user interfaces. Visual interfaces to digital libraries have recently found widespread attention. This development is mainly due to the fact that information visualization techniques allow for rich representation of information-bearing objects found in digital libraries. There are also a number of information visualization areas

related to digital libraries, namely bibliometric studies, information retrieval (query and result), scientific visualization, as well as knowledge domain visualization. This chapter will review and analyze metadata-enabled visual interfaces to digital libraries based on the richness and variety of metadata elements used and the visualization approaches adopted on the interface. The first part of this chapter will provide a brief overview of visual interfaces developed based on thesauri as one source of subject metadata. The second part of this chapter will review and analyze innovative metadata-enabled visual interfaces to digital libraries. The final section will present a general discussion of the reviewed interfaces in terms of their visualization approaches and metadata elements used within the context of digital library developments. The current study draws on the research carried out in the areas of digital libraries, interface design, human computer interaction, and metadata.

### **EARLIER INFORMATION RETRIEVAL VISUAL INTERFACES USING THESAURI**

MeSHBrowse (Korn & Shneiderman, 1995), a prototype interface for browsing the medical subject headings (MeSH) thesaurus, employs a concept space approach and a node-link tree diagram of the concept space. Hidden interrelationships of the terms are revealed once a node is clicked. The graphical nature of the interface allows only for related categories of terms to be displayed in a two-dimensional tree structure. Cata-cone (Hearst & Karadi, 1997) utilizes a three-dimensional graphical interface which shows all of the top level categories initially and allows for the user to control the subsequent expansion. An alternative mode of interaction is to have the user type in a category label and see which parts of the hierarchy match or partially match that label. The interface also caters for a kind of relevance

feedback by suggesting additional categories. Users can jump easily from one category to another and can search on multiple categories simultaneously. The visual MeSH (Lin, 1999) is a graphical interface developed to interact with the MeSH thesaurus and Medline. It allows the user to look up MeSH terms in a click-and-choose environment and assists users in exploring the MeSH terms by providing several views of the concept, including tree view, neighbor view, and map view. On any of the views, the user can double-click on a term to select it. Sutcliffe, Ennis, and Hu (2000) describe a visual interface enhanced with a thesaurus called the integrated thesaurus-results browser, which provides simultaneous access to query bar, thesaurus terms and structure, as well as search results. The thesaurus is a major feature of the interface, allowing for search term selection and query specification or modification.

### **INNOVATIVE VISUAL INTERFACES TO DIGITAL LIBRARIES**

Börner and Chen (2002) identify three usage scenarios for visual interfaces to digital libraries: (1) support the identification of the composition of a retrieval result, understand the interrelation of retrieved documents to one another, and refine a search; (2) gain an overview of the coverage of a digital library and to facilitate browsing; and (3) visualize user interaction data in relation to available documents in order to evaluate and improve digital library usage.

The present chapter aims to review and briefly analyze a specific category of digital library visual interfaces that support information seeking and retrieval based on metadata representations. I will call this category “metadata-enabled visual interfaces.” The focus of these interfaces is mostly on the ways in which metadata elements and visualization approaches can be utilized to richly represent the content of digital library collections. This type of interface enables users to

6 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

[www.igi-global.com/chapter/metadata-metaphors-visual-interfaces-digital/19890](http://www.igi-global.com/chapter/metadata-metaphors-visual-interfaces-digital/19890)

## Related Content

---

### A Unified Algorithm for Identification of Various Tabular Structures from Document Images

Sekhar Mandal, Amit K. Das, Partha Bhowmick and Bhabatosh Chanda (2011). *International Journal of Digital Library Systems* (pp. 27-54).

[www.irma-international.org/article/unified-algorithm-identification-various-tabular/54186](http://www.irma-international.org/article/unified-algorithm-identification-various-tabular/54186)

### Insourcing and Outsourcing of Library Technology

Edward Iglesias (2020). *Digital Libraries and Institutional Repositories: Breakthroughs in Research and Practice* (pp. 59-66).

[www.irma-international.org/chapter/insourcing-and-outsourcing-of-library-technology/250660](http://www.irma-international.org/chapter/insourcing-and-outsourcing-of-library-technology/250660)

### Assessment and Measurement of Education Programs of Information Literacy

Marzieh Siamak, Shida Fathi and Alireza Isfandyari-Moghaddam (2018). *Digitizing the Modern Library and the Transition From Print to Electronic* (pp. 164-192).

[www.irma-international.org/chapter/assessment-and-measurement-of-education-programs-of-information-literacy/188027](http://www.irma-international.org/chapter/assessment-and-measurement-of-education-programs-of-information-literacy/188027)

### Assessment of the Social Media in Knowledge Sharing: A Sociological Study

P. K. Muthukumar (2020). *Challenges and Opportunities of Open Educational Resources Management* (pp. 224-236).

[www.irma-international.org/chapter/assessment-of-the-social-media-in-knowledge-sharing/258136](http://www.irma-international.org/chapter/assessment-of-the-social-media-in-knowledge-sharing/258136)

### A Presentation-Preserved Compositional Approach for Integrating Heterogeneous Systems: Using E-Learning as an Example

Fang-Chuan Ou Yang (2011). *International Journal of Digital Library Systems* (pp. 67-85).

[www.irma-international.org/article/presentation-preserved-compositional-approach-integrating/59889](http://www.irma-international.org/article/presentation-preserved-compositional-approach-integrating/59889)