

## Chapter XIII

# Beyond OpenURL: Technologies for Linking Library Resources

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### **ABSTRACT**

*This chapter provides a general overview of the development and implementation of existing techniques for the reference linking of scholarly research materials, additionally, some of the new techniques designed for advanced linking are described. Also presented are several new technologies currently under development, with an eye toward enhancing resource discovery and the interlinking of resources. The progress of computer technology, the adoption of those technologies by the information consumer, and the implementation of Web 2.0 and Library 2.0 tools to existing resources have combined in opening up new avenues of linking previously isolated resources together. Information professionals must come to appreciate and apply these new techniques and in doing so will provide library patrons with a more user friendly and thorough research experience.*

### **INTRODUCTION**

The ready availability of Internet resources has revolutionized the research process, richly enhancing resource discovery and being presented with links to related subject matter, with the major benefit coming from the convenience of performing research in a virtual environment. Initially, Internet based resources were located

at static URLs on servers, with established links pointing toward these addresses. When the addresses of these resources changed through relocation to a new server or site redesign these connections were broken, necessitating frequent verification and updating, highlighting the need for more reliable forms of linking these resources together. Several techniques have been introduced in a search to resolve this dilemma, culminating

in the digital object identifier protocol and the present openURL standard.

The continuing introduction of new computer technology, an increasing quantity of information, and the availability and use of new multimedia formats further illustrate the need for the continuing improvement of linking technologies. This chapter explores the development and implementation of linking standards, examines the practices of today and reviews some of the enhanced linking technologies currently under development with a design for meeting future challenges (Frick, Duncan, & Walsh, 2005).

### **EARLY LINKING PROTOCOLS AND THE APPROPRIATE COPY PROBLEM**

A central concern for all types of linking initiatives focuses on directing users to accessible and licensed material. In order to address the problem of linking to the “appropriate copy,” several proprietary and provider specific linking programs were initiated. In these instances, a subscriber indicates to a database vendor the accessible resources for that given institution. The vendor then applies that information using proprietary programming providing outbound links to the appropriate copy. These technologies present the user with reliable context sensitive links from abstracting and indexing databases to an institution’s subscribed resources.

Examples of vendor supplied context sensitive linking products include: Ebsco’s SmartLinks, the Institute of Physics’ HyperCite, BioMednet’s Bundled Link, OVID’s OpenLinks and Silverplatter’s SilverLinker products. Also, several publishers provide proprietary “link-to-services” such as Academic Press, the American Physical Society, Elsevier, and UMI’s sitebuilder. Applying these services allows for context sensitive linking to the appropriate copy. The appropriate copy problem can be addressed by using the linking to a

library holding by means of a publisher service, like Silverlinker, or a link resolver, such as SFX, based on technology developed by Herbert Van De Sompel. (Grogg & Tenopir, 2000) However, with the increasing number of electronic resources available, maintaining these systems increasingly have become problematic.

At the same time, publishers and providers were working on providing bidirectional-linking services. Beginning in 1997, one of the first efforts for providing outbound linking to related resources began with the Chemical Abstracts Service’s Chemport Connection <http://www.chemport.org/>. Several publishers and content providers followed by offering inbound links to CAS under the name “ChemPort Reference Linking Service” (Grogg, 2004). The Web of Science aggregator from the Institute for Scientific Information offers both bidirectional linking between web of science records and content from selected publishers. Openly Informatics also provides an interpublisher linking solution called “Scholarly Link Specification Framework.”

While not providing the standards based linking protocol the openURL would later become, these services were a precursor of the openURL and basically solved the appropriate copy problem.

### **OPENURL AND DOI: THE PRESENT STANDARDS**

Two technologies widely recognized today for solving the problems associated with reference linking are the openURL and the digital object identifier (DOI), with both of these technologies providing a means for dynamically linking electronic resources.

The earliest proprietary linking systems required extensive maintenance and formal interpublisher agreements. These particular problems were remedied by the Publishers International Linking Association in 2000 through the work

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