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The Development of the NISO Committee AX’s OpenURL Standard

Arthur Hendricks

This paper describes the development of the OpenURL standard and how it will impact librarians and information technologists. This article is based on information provided via email inquiries sent to members of the National Information Standards Organization (NISO) Committee AX responsible for producing this standard. The OpenURL syntax is designed to enable linking between heterogeneous information resources via the Internet. The standard is based on the idea that links should lead to a user to appropriate resources. Currently, Web links do not take into account the identity of the user or the Web page. When more than one institution provides access to copies of the same electronic document, the link from the citation to the full-text article should point to a copy that is available to the user. Since different users may have access to different resources, the link should resolve what the link must be able to package metadata and identifiers describing the information object, and send this package to a server that resolves the link. The resolver should take into account the user’s identity when resolving the metadata into specific articles.

In the OpenURL framework, information resources allow for open linking by including a hook, a programmer-defined customization, along with each metadata description that they present to users. This hook presents itself in the user’s browser as a clickable link called an OpenURL. This article describes the development of the OpenURL standard and how it will impact librarians and information technologists. Much of the information provided here was obtained via e-mail inquiries sent to members of the National Information Standards Organization (NISO) Committee AX responsible for producing the OpenURL standard. See appendix A for the list of questions submitted to the committee members. This standards committee, formally designated NISO AX, consists of seventeen members and four observers from diverse backgrounds and workplaces (libraries, publishers, and service providers.) See appendix B for a list of bibliographic information on the respondents.

History

The OpenURL concept evolved from research by Herbert Van de Sompel and his team at the University of Ghent in Belgium. In 1998 they began to explore the role of local link servers for libraries to facilitate context-sensitiv linking between heterogeneous scholarly resources. As a result of this work, the first context-sensitive link server, titled SFX, was developed. Ex Libris was one of the technology partners involved in this experimental work, and Oren Beit-Arie, Ex Libris Group vice president for research, was assigned to the project. In February 2000, Ex Libris purchased all rights to develop and market the SFX technology. SFX-URL was developed as a protocol for transporting metadata from sources to the SFX server.

In March 2000, Van de Sompel, Hochsteinbach, and Beit-Arie began work on a general framework to enable a standardized infrastructure for open and context-sensitive linking. This led to the creation of the first draft of the OpenURL standard, which was posted publicly in April 2000 at www.sfxit.com/openurl.html, and they subsequently published an article summarizing the OpenURL standard in D-Lib Magazine. In December 2000, Van de Sompel and Beit-Arie submitted the OpenURL specifications to NISO for its official standardization. The OpenURL standard was accepted as a fast track work item. NISO is a nonprofit association accredited by the American National Standards Institute (ANSI). Its charge is to identify, develop, maintain, and publish technical standards. NISO standards apply both traditional and new technologies to information-related needs, including retrieval, storage, metadata, and preservation. The working draft of the OpenURL standard is available at http://library.caltech.edu/openurl/Working_Documents.htm.

Scope and Application of the OpenURL Standard

The AX committee members were each asked to describe the scope and application of the OpenURL standard and state what problems the standard addresses. Most stated that it was originally developed for providing context-sensitive linking in a scholarly Web-based information environment. According to Ann Apps, researcher for Manchester Information and Associated Services, “The current draft OpenURL (version 0.1) of the standard defines ‘by-value’ metadata for particular bibliographic resources (or pointers) (journals and articles,

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are now looking to standardize our linking on the OpenURL whether its internal linking, inbound, or outbound. Links between our platforms will most likely be OpenURL based. The standard does allow for a 'local zone' so we can incorporate product specific information if we need to." 

**Other Metadata Standards**

While other metadata standards, such as Dublin Core (DC), OAI, ONIX, MARC, Z39.50, and so on, continue to be vital standards in the Web environment, OpenURL is different in such a way that it adds natural intelligence to the computer-to-computer process to navigate complexity, and OpenURL resolvers don't take metadata and immediately hand off whatever resources come up—a process that will frequently fail because the metadata is incomplete or because the source database and the object resource follow different rules. Instead, resolvers apply as much logic as they can, then offer the user a menu showing a range of possibilities. 

The committee members were asked how the OpenURL standard differs from other metadata standards and whether OpenURL would affect other metadata standards. Most stated that OpenURL is not a metadata format in itself, but a means of transporting metadata. Apps stated,

OpenURL is transportable metadata and it is primarily concerned with bibliographic resources. It is really defined for linking to other resources, whereas DC is concerned with metadata about a resource itself. It has a defined syntax, whereas DC has defined semantics which can be used within various syntaxes. OAI is about disclosing/harvesting metadata, not about providing links. 

Apps also stated that OpenURL could be employed within DC to record the bibliographic citation of a journal article. Unlike DC, OpenURLs are not human-readable and therefore not very suitable for resource discovery results. It is possible that XML schemas will be developed for OpenURL. If so, these could be used by both DC and OAI as schemas for encoding bibliographic citation information. "It appears that OpenURL is the first standard to standardize the elements of a bibliographic resource citation." 

Norman added: 

It is envisioned that the OpenURL registry will allow new metadata formats to be created using XML schemas. Existing metadata formats such as MARC XML can also be registered once the registry is made public. Additional metadata encoding or transport methods such as RDF and Relax-NG may be added later in order to extend the use of existing metadata formats such as Dublin Core.

**Impact on Libraries**

The benefits of the OpenURL standard to libraries and information service providers are enormous. Recently Research Libraries Group (RLG) revealed its full support for OpenURL dynamic link creation in the newest version of Eureka. "Eureka now enables librarians and their users to find virtually everything the library can provide, both online and on the shelf," said Walt Crawford, senior Eureka analyst at RLG. Ex Libris's product SFX allows users to search a database and click on a resulting citation to search it automatically in other databases. Other library systems vendors such as Endeavor and Innovative Interfaces Incorporated (III) also are developing products with support for OpenURL. The committee members were also asked how they see the introduction of the OpenURL standard impacting libraries.

Van de Velde replied, "The most important impact is that users are
guided to resources they’ve never even heard of, just by clicking on some of the options available on the menu of services. It makes it easier on the library to let users know what is available.  

According to Beit-Arie:

Primarily it enables libraries to take control of their own linking environment. Libraries can determine what resources should be linked and in what manner. With the OpenURL open linking framework, libraries can also incorporate local resources and services into their interlinked environment. Further, libraries can consolidate the maintenance of links via their OpenURL link server. 

He also pointed out that OpenURL virtually changes the way patrons navigate and use electronic resources. The fast acceptance of the standard in the scholarly information industry at large, considering it was only first published in April 2000, attests to that.

Apps wrote that libraries will be under pressure to purchase OpenURL resolver software to provide their users with full-text links. Using a resolver seems to require a large overhead in maintaining holdings information. She also stated that libraries probably will not need to encode OpenURLs unless they want to include them in custom-made OPACS. OpenURLs are generally provided in source abstracting and indexing databases. Libraries will have to provide help and training to their users to explain OpenURL links and functionality.

When asked what potential library projects would benefit most using the OpenURL standard, Van de Velde stated succinctly, "The usefulness of any database is enhanced when it is OpenURL enabled, because the database can now be used to deliver localized services." Beit-Arie illustrated the benefits to libraries in a broader sense and listed three applications of OpenURLs.

The first application is collection development and management. Through OpenURL linking, libraries collect valuable information and usage statistics that can help them in collection development. The second application is approval plans. According to Beit-Arie, some very interesting work is happening in this area in conjunction with OpenURL linking. The third application is resource sharing and consortial environments.

OpenURL linking can facilitate some very interesting methods of resource sharing amongst consortia members. SFX, for example, is implemented in a number of very different consortia environments in which—to a different degree—resource sharing among members occurs. With OpenURL linking, sharing can happen on-the-fly while retaining independence of member institutions.

The Roles of Libraries and Librarians

The advice and insights offered by the experts on the committee regarding the roles that libraries and librarians should play concerning OpenURLs was enlightening. Most members recommended that libraries be aware of OpenURLs and insist that products that they purchase use them. Karim Boughida replied, "Be an early adopter . . . it's a library-driven project versus database or publisher vendor-driven. It's empowering librarians and end-users." As indicated by Van de Velde, "Librarians need to be aware of this in their negotiations with data providers. They must insist that databases are OpenURL enabled."

Beit-Arie wrote that OpenURL defines a low barrier mechanism and specification for a very important piece in interoperability of scholarly information. Libraries and information providers alike can benefit from implementation of the OpenURL's open linking framework. Librarians should aim at having OpenURL compliance with every resource to which they license or subscribe. Information technologists should bear OpenURL in mind when designing and implementing new applications.

OpenURL can carry either very minimal or very extensive and complete metadata about a referenced work. For OpenURLs to be effective for the purpose of provision of context-sensitive linking, libraries should ensure that vendors provide sufficient metadata to meet the needs of context-sensitive services. According to Beit-Arie, there is now an active lobbying group among SFX customers to ensure that vendors meet the standards required by libraries. "Ex Libris has also played an active role in working with vendors to ensure that the OpenURL is effective." Some committee members had warnings about OpenURLs. According to Fegan, "It isn't perfect. It doesn't fix data discrepancies. It assumes that the metadata that is transported from one system can be properly interpreted and matched in a second system. Differing editorial policies, tagging rules, etc. . . . are still problematic. Librarians need to understand that there will be errors." Norman also expressed the same warning: "Be aware that OpenURL is not another searching protocol or metadata format. It is for transporting metadata in a specific context." On the other hand, libraries with OpenURL servers will help their users save time by easily connecting users with library-supplied resources that link to items identified through searches from services such as OCLC FirstSearch.

Norman also stated that library staff can set up the OpenURL server link in FirstSearch with a minimum of effort and without the need for extensive technical expertise. "Libraries can link to FirstSearch full-text, OCLC and local Z39.50 Holdings, and other
Concluding Comments

Clearly OpenURLs are the next logical step in the evolution of the Web. On the OpenURL Web site, there is a link to a song by Fatboy Slim titled "Weapon of Choice." Part of the refrain is "check out my weapon, my weapon of choice." According to Van de Velde, "The theme song was by coincidence. The video had just come out around the time of our first meeting. I had downloaded it on my computer and showed it to the committee. I believe it was Herbert who pointed out that OpenURL was indeed a "Weapon of Choice" in two ways: it is a preferred weapon, but it is also a weapon that provides choice ..." 

Hopefully libraries will embrace OpenURLs and give their users their own personal weapon of choice.

Acknowledgments

I wish to thank committee chair Eric F. Van de Velde, director of Library Information Technology at the California Institute of Technology, as well as the other committee members, including Oren Beit-Arie, Ann Apps, Phil Norman, Todd Fegan, and Karim Boughida, for their responses to my inquiries.

Committee-Recommended Resources

The committee members were asked for the top three resources they recommend to readers to learn more about the OpenURL projects. Most mentioned the NISO AX site (http://library.caltech.edu/openurl) and the site’s bibliography (http://library.caltech.edu/openurl/Bibliography.htm). Apps reminded us that, "The NISO AX site provides information about the development of the standard. Other Web sites I’m aware of are commercial."

Beit-Arie added four following listings he felt were relevant:

- NISO AX OpenURL Web site, http://library.caltech.edu/openurl

Beit-Arie’s third listing is the first article about OpenURL that describes both the OpenURL framework and its specification in some great details. It also contains a section about the DOI/ CrossRef/OpenURL integration project. The fourth listing lays the groundwork for the current development of OpenURL v1.0 by the NISO AX Committee.

Boughida recommended the following articles from RLG and OpenURL in Focus 56, June 2002 (www.rlg.org/r-focus/ifocus/56#sfx):

- "Connecting Citations and Full Text: Eureka and OpenURL," Walt Crawford, RLG
- "Implementing OpenURL Linking with SFX: The NYU Experience," Gloria Rohmann, New York University
- "OpenURL at the University of Chicago Library," Jim Mouw, University of Chicago
- "Implementing OpenURL: Advice from the Library Trenches," Kimberly Parker, Yale University

Boughida also recommended the OpenURL white paper, prepared by Harry E. Samuels, digital library projects coordinator, Endeavor Information Systems, available at www.endinfosys.com/pdf/openurl4_02/pfd.

Appendix A: Interview Questions

The following inquiries were sent via e-mail to the members of the National Information Standards Organization (NISO) Committee AX
responsible for producing the OpenURL standard.

1. When and how did you become involved in the OpenURL project?
2. Please describe the scope and application of the OpenURL standard. What problems does the OpenURL standard address?
3. Initially, what applications did you envision utilizing open URLs? Has that changed as this project evolves?
4. How different is the OpenURL standard from other metadata standards, such as Dublin Core, OAI, ONIX and etc.? Would the OpenURL standard affect/enhance other existing standards and practices? How?
5. How do you see the OpenURL project impacting libraries?
6. What are the potential library projects that would benefit most using the OpenURL standard?
7. What is important for librarians and information technologists to be aware of concerning OpenURLs?
8. What are the top three resources you recommend for readers to learn more about the OpenURL projects, (for example, resources, Web sites, etc.)
9. What biographical information shall I add to this article?

Appendix B: Respondent Biographies

This appendix provides information about the positions held by the respondents and also their academic training.

Ann Apps is a researcher for Manchester Information and Associated Services (MIMAS), at the University of Manchester, England. She is also chair of the Dublin Core Citation and Type Working Groups and a member of the Dublin Core Advisory Board. She is a member of the CEN/ISSS Workshop on Metadata for Multimedia Information-Dublin Core (MMI-DC), the European standards initiative, as well as a member of the Committee of the British Computer Society Electronic Publishing Specialist Group.

Oren Beit-Arie is Ex Libris Group Vice President for Research and the managing director of the Information Services Division, a division within Ex Libris Group that develops and markets the SFX link server. He began work on the OpenURL standard (now known as OpenURL v.0.1) that was first published in April 2000, and worked extensively on promoting the OpenURL’s Open Linking framework with libraries and information providers. He has degrees in mathematics, computer science, and theoretical linguistics.

Karim Bougaida is a senior information systems architect at the Getty Research Institute. He has an MLIS from the University of Montreal, Canada. Before joining the Getty, he was responsible for digital library products at Endeavor Information Systems, Chicago, a leader in library and information systems. Prior to that, he was responsible for knowledge records information in database systems in various sectors (government, financial, etc.). Karim has been with the computer and information industry for more than thirteen years.

Todd Fegan is the vice president of ProQuest Product Management and has been with ProQuest for ten years.

Phil Norman earned a bachelor’s of science degree in data processing technology from the Speed Scientific School of the University of Louisville. Prior to joining OCLC, he was a computer specialist for the IRS. He has been working at OCLC for over fifteen years. He was the project manager of the first release of FirstSearch in 1991 and has been associated with that product ever since. His current title is Senior Technical Manager of the User Interface Section of the Cooperative Discovery Services Division.

Eric F. Van de Velde is the director of Library Information Technology and at the California Institute of Technology. He holds a Ph.D. and a M.Sc. in mathematics and a M.E. in computer science.

Using Microsoft SharePoint Team Services for Library Committee Management

Abhijit Rao

Library committees work for the improvement and technological advancement of library services. Managing these committees is not an easy task, especially when there are subcommittees within a larger committee. Inefficient management often leads to the disorganization of information and ultimately affects the objectives of the committee. This article explores the possibility of using Microsoft SharePoint Team Services, a team Web site solution, for easier and more centralized management of library committees.

Library staff work in groups to improve library services and ensure the best service for their patrons. These groups, also known as committees, have goals to realize and deadlines to meet. They are involved in regular meetings, training and discussion sessions, and many other developmental activities. Due to the heterogeneous nature of this type of committee, where members are both within and outside the organization, library committee management demands organization.

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