

# Using XML Technologies to Organize Electronic Reference Resources

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## Abstract

*Provision of access to reference electronic resources to clinicians is becoming increasingly important. We have created a framework for librarians to manage access to these resources at an enterprise level, rather than at the individual hospital libraries. We describe initial project requirements, implementation details, and some preliminary results.*

## Introduction

The new generation of clinicians is more likely to be efficient in computer search strategies. Studies among medical students and faculty have shown that electronic reference resources (“*e-resources*”) are preferred over paper [1,2]. The number and variety of licensed and/or freely available *e-resources* is steadily growing, and clinicians are asking for widespread and seamless access to them. Considering the advantageous enterprise-wide licensing options available, a centralized approach to *e-resources* management is now preferred.

## Requirements

At Intermountain Health Care (IHC), we have created a new framework for managing links to *e-resources*. Before our project started, librarians at four hospitals managed and published local web pages with links to locally selected *e-resources*. In addition, IHC’s clinical information system had a different web page with links to *e-resources*.

The following requirements were identified:

- a) Centralize the storage and access to a consolidated set of links to *e-resources*;
- b) Enable direct maintenance of *e-resources* links by librarians;
- c) Facilitate the use of *e-resources* links by multiple systems and web sites, including IHC’s clinical information system, library portals, and enterprise intranet;
- d) Whenever possible, identify the user that is accessing an *e-resource* link;
- e) Provide seamless user authentication for any *e-resource* that requires it;
- f) Whenever possible, identify the user’s physical location, connection method (e.g., VPN, intranet), and main clinical role (e.g., physician, nurse, patient);
- g) Create a method to display announcements or news related to the *e-resources*;
- h) Track user utilization of the *e-resources*.

## Implementation

Motivated by the concept of “single source publishing,” we decided to implement the new *e-resources* management framework using XML technologies. First, we identified the core metadata associated with an *e-resource* link and created an XML Schema to represent these metadata. Second, using our existing knowledge-authoring environment [3], we implemented a web form to create and maintain these metadata. We trained the librarians on how to use the authoring environment and the new web form. Third, using XSL Transformations (XSLT) we generated an HTML page with the applicable *e-resources* links. The resulting page represents a customized set of *e-resources* links, taking into account the contextual information about the user (location, connection method, and role). The generated page also includes the necessary components for detailed usage tracking.

## Preliminary results

The proposed framework was implemented in August 2004. The new context-aware corporate *e-resources* page has successfully replaced the local pages previously used by the hospitals. IHC’s clinical information system and intranet also use the new context-aware *e-resources* page. From December 2004 to February 2005, the system registered an average of 20,935 hits per month (a “hit” being defined as anytime an *e-resource* link is accessed). Detailed evaluation of the clinicians’ usage, as well as librarians’ satisfaction with the new framework, are ongoing.

## References

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