

# Chapter 10

## User Search Activities within an Academic Library Gateway: Implications for Web-scale Discovery Systems

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### **ABSTRACT**

*Academic libraries are transitioning from access systems based on federated, broadcast search technologies to Web-scale discovery systems with central, aggregated indexes. It is important to understand user information seeking behaviors, but knowledge of user searching patterns in online catalogs is incomplete and contradictory. The University of Illinois at Urbana-Champaign Library has been collecting custom transaction log data from a main gateway built around the Easy Search (ES) federated search system. ES provides contextual search assistance suggestions that facilitate search reformulation and performs added title and phrase searches. An analysis of the transaction logs has revealed information on user search characteristics and search assistance usage. These findings show the importance of known-item searching, including journal, book, and article title searches. The Illinois team has been working with Web-scale discovery system vendors on a hybrid approach that incorporates search assistance and recommender elements with Web-scale aggregation and blended result displays.*

DOI: 10.4018/978-1-4666-1821-3.ch010

## **INTRODUCTION**

Search and discovery services offered by research libraries are currently at a crossroads. During the last decade, library gateway search services embraced federated search as a complementary service for local and consortial online public access catalogs (OPACs) (Williams, et al., 2009; Tallent, 2010; Alling & Naismith, 2007). In the last two years, the federated search approach has been superseded by the introduction of Web-scale discovery systems or next-generation catalogs (Ballard, 2011; Rowe, 2010; Williams & Foster, 2011; Fagan, 2011; Vaughan, 2011; Wisniewski, 2010). For retrieval purposes, the Web-scale discovery systems employ aggregated central indexes with heterogeneous metadata and content as opposed to the broadcast search approach employed by federated search systems. However, Web-scale systems can include a broadcast search component.

As libraries enter this transition paradigm, it is important to better understand user search behaviors and practices. In particular, models for user searching within the OPAC environment are incomplete and occasionally contradictory. While there is a great deal of research on end-user searching in both Web search engines and online catalog environments, there is a clear need for an evidence-based analysis of user search behaviors in multidimensional retrieval environments such as those offered by Web-scale discovery systems (Markey, 2007b; Tallent 2010; Lindahl, 2007; Hanson et al., 2009). The search behavior issues are detailed in the literature review below.

The University of Illinois at Urbana-Champaign (UIUC) Library has been gathering detailed data on user search behaviors within its main interface gateway. In the fall of 2007, the Library deployed a redesigned main gateway site featuring a single-entry search box that provides integrated access to the distributed information landscape (see Figure 1). The gateway was built over a locally developed federated search system, called

Easy Search, which provides access to the journal literature, online catalog records, publisher e-book result matches, Web search engines, e-resource A-to-Z lists, and other targets. The Easy Search (ES) software suite functions as a discovery and recommender system, presenting users with a range of result links that provide entry into the native mode interfaces of designated targets at the point of completed search.

One of the major foci of the Illinois project work has been to identify and characterize user search behaviors within an academic library gateway. With the support of an IMLS National Leadership Grant and an NSF National Science Digital Library (NSDL) grant<sup>1</sup>, the Illinois team has been gathering data from custom Easy Search (ES) transaction logs built and populated to provide comprehensive information about user search activities and user selected target (click-through) actions. The custom transaction logs capture and record all user entered search terms, any system generated search assistance suggestions or display prompts, and all subsequent user follow-on actions.

Using the data gathered from these custom logs, the ES team has introduced and tested a number of key search assistance functions designed to guide users in search strategy modification and reformulation and in the selection of relevant information resources. These Search assistance mechanisms offer users suggestive prompts, guided and adaptive help, reformulation suggestions, and added links and facets all within the context of their specific search. The search results display screen with a number of system search suggestions is shown in Figure 2.

The Illinois system provides what several authors have described as a just-in-time search assistance environment using strategic help and collaborative coaching techniques (Brajnik, Mizzaro, & Tesso, 2002; Antell & Huang, 2008; Graham, 2004). Evidence suggests that successful automated assistance systems need to offer context-specific assistance at those points in the

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