A casual Google search may well be good enough for a daily task. But if you are a college student conducting his or her first search for peer-reviewed content, or an established scholar taking up a new line of inquiry, then the stakes are a lot higher. The challenge for academic libraries, caught in the seismic shift from print to electronic resources, is to offer an experience that has the simplicity of Google—which users expect—while searching the library’s rich digital and print collections—which users need. Increasingly, they are turning to a new generation of search tools, called discovery, for help.

Libraries have been striving to respond to this challenge for years. The metasearch tools of the past decade—while different (and, ultimately, too slow)—were the first attempts to meet this user expectation by querying each of the databases a library subscribed to and returning a single set of results.

Enter discovery, which is modeled on the Google-style approach of building and then searching a unified index of available resources, instead of searching each database individually. While Google’s general index focuses on publicly available web content, these new discovery tools—including EBSCO Discovery Service and Serials Solutions’ Summon, among others—provide unified indexes of the licensed scholarly publications combined with locally held content (like the catalog).

In effect, discovery tools make good on the promise of those earlier search solutions by shifting some of the IT management responsibilities to the cloud, streamlining search, and improving the relevance ranking of results. And users get to enter a single query—a la Google—to search the rich content of the collection with the speed they have come to expect. Still brand new, and in
action in only a handful of academic libraries, these tools are expected to transform search as we know it.

The challenge of findability
In a March 1994 Wired magazine article, nearly two years before the start of the research project that would become Google, futurist Paul Saffo made a prediction: “The future belongs to neither the conduit or content players, but those who control the filtering, searching, and sense-making tools we will rely on to navigate through the expanses of cyberspace.” That insight is as relevant to today’s world of scholarly information as it continues to be for the other digital media that fill the Internet. When we look back at the early days of Internet search, we see that, while breadth of content was critical for search engines, the real success came from the algorithms that by also searching library databases individually. Librarians hoped that metasearch engines, also referred to as federated search engines, would simplify searching across these databases, but they have fallen short of librarian expectations—owing in part to structural complexities, as connectors to each resource are hard to maintain. They have also disappointed users—due to their slowness of response, problems with relevance ranking, and inadequate handling of duplicates.

The new unified-index discovery tools offer great potential for simplifying scholarly search and making it more effective. As with all technology solutions, however, myriad details need to be sorted out in the move from concept to operational success. And the differences in how these tools are being implemented have implications for both libraries and for the publishers that supply the information.

What to consider
Librarians have been examining these new discovery tools carefully, but comparisons have been frustrating because these products are new and enhancements are ongoing. Nonetheless, librarians have narrowed in on certain features and capabilities that are key to making decisions about these tools. Naturally, different institutions weigh each factor differently based on local needs and objectives, collections, users, and staffing. Leading factors are:

**CONTENT**
- Scope and depth of content being indexed.
- Richness (and consistency) of metadata included in the indexes.
- Frequency of content updates.
- Ease of incorporating local content, if desired.

**SEARCH**
- Simplicity of the interface.
- Quality of results, including relevance ranking.
- Ability to customize search and relevance settings.
- Availability of tools for navigating search results (such as clustering, facets, etc.).
- Ease of incorporation into existing institutional access tools.
- Support for new use environments, including mobile access and social-networking features.

**FIT**
- Ease of implementation.
- Compatibility with existing software and content.
- Responsiveness of the vendor and alignment of priorities regarding future developments.
- Overall customer support, including reputation and prior dealings with the vendor.

**COST**
- As a new service in addition to existing tools.
- Instead of other finding tools or delays to other upgrades.
- Justification in light of libraries’ goals and objectives.

Content
To create a unified index, vendors need to secure permission from each publisher. While agreements take time, the amount of content included in the indexes is growing steadily. As more libraries implement discovery tools, primary publishers that have not yet agreed are likely to feel pressure from libraries that expect acquired content to be accessible through these tools.

While it’s possible to determine which databases or individual titles are included, a detailed comparison of discovery services at the title level is an overwhelming task, as coverage of titles varies based on the depth of the archive and the currency of the content. Local content in institutional repositories can be included with OAI (Open Archives Initiative) harvesting of metadata and ingestion of MARC records from the OPAC. Catalogers may weigh in on the fields from MARC records that are indexed, which can affect discovery. Librarians may also need to consider special collections or files with audio, video, and images.
Librarians need to think about the role they want discovery to play in their libraries. If the tool is considered a place to start and a way to reach more library users, then complete coverage in a unified index may not be necessary for the undergraduate who is simply seeking "an answer." Others might decide it is even more important for the starting point to be as complete as possible. If the single search box is viewed as being the front door to all the libraries' resources, then librarians also need to consider how to present what is not included in the unified index.

Search
Discovery tools can effectively integrate libraries' resources with a single query across multiple databases that normally function as information silos. In essence, these tools create a unified space for integrating access to a diverse group of digital and print resources.

Vendors are fine-tuning their algorithms to adjust the relevance of search results. For example, many users expect searches to display a book itself before reviews of that book in a results set. With journal articles, books, newspapers, conference proceedings, and other formats indexed together, vendors must consider how to weight the content types in response to queries.

The single search box lets users approach discovery tools with what they know and rely on filters to narrow the results. Scott Anderson at Millersville University, PA, which uses EBSCO Discovery Service, says, "We liked the idea that discovery tools reduce the cognitive load that the user has to know about the library." Facets that enable users to filter results by content type, subject terms, publication date, language, and other categories can also serve to acquaint users with the scope of literature available on a topic.

Librarians will need to decide where to place the search box on the library's website. Reference librarians may wish to identify additional resources not included in search results, or to highlight finding aids to help orient users. The single search box can be placed in course management applications such as Blackboard, or, ideally, into the student's workflow, wherever that may be. As Jennifer Duvernay at Arizona State University (ASU), an early installation of Summon, notes, "We can't wait for the students to come to us; we have to go to them, embedding the search where they are working."

Fit
The desire to customize a system will vary by library. Librarians are inquiring about local control of system elements, from appearance (including labels for facets) to the ability to modify relevance ranking. Library staff with the technical capability to manage application programming interfaces (APIs) may want to add links to databases that are not included and establish profiles for disciplines. To incorporate local content seamlessly may involve including additional format types (such as government documents) or influencing metadata fields that the vendor indexes.

Holdings display and real-time data on availability of items will be important for those involved with consortial lending. While link resolvers appear to be compatible, data management may be required to address holdings or other factors that receive new visibility.
Motivation and benefits

Discovery tools are evolving rapidly with input from partner libraries and through usability studies with end users. Early adopters were eager to address the growing number of databases and worked with their vendor partners to influence development. For libraries now looking at these tools, the sequence of planned enhancements may influence purchase decisions as a common feature set emerges to meet market expectations.

Discovery tools can leverage the institution’s library investment through increased use of library resources, which can demonstrate value to provosts. Better access for undergraduates results in greater productivity for its users. Librarians at George Washington University, which chose EBSCO Discovery Service, have studied the options and see discovery services as “a tool that would reveal our content so that it’s not hidden.”

Many librarians who believe that discovery tools are a good first step in meeting the needs of the undergraduate student who is unfamiliar with the library’s resources, discover it also meets the needs of researchers. Bryan Skib, associate university librarian for collections at the University of Michigan Library, which chose Summon, notes, “While very good for known-item searching, it’s ideal for interdisciplinary research and for those who don’t know what they’re looking for or what databases to use.”

Decisions and funding

While the decision to acquire a delivery tool is often led by a champion at the institution, the selection process tends to be shaped by environmental factors, such as synergy with existing systems or current sources of content and, of course, the available budget. A number of libraries that found federated search unsatisfactory have been eager to switch to or acquire a unified index to offer users a better experience. The new discovery tools that incorporate federated search techniques use them as a complement to cover additional databases not included in the unified index and to provide a more comprehensive view of the libraries’ resources.

Since buying a discovery tool is a new expense for libraries, funding has come from the systems or collections budgets, special allocations or possibly staff savings. At James Madison University (JMU), Harrisonburg, VA, which selected EBSCO Discovery Service, Jody Fagan says, “I can explain to library patrons why we don’t have a particular database, but I can’t explain why they have to use different search boxes for books and journals.”

Some libraries form a team to conduct a thorough evaluation; it is likely to include staff from collection development, electronic resources, and bibliographic instruction, with input from cataloging. The team may also conduct side-by-side tests and consider factors such as ease of implementation, website changes, use of a link resolver, and customer support.
User opinions

Libraries are pleased with these tools and getting positive feedback from users. Early results show increased usage of library databases.

For experienced users and librarians at some schools, the reaction is mixed. "Some librarians love it and some hate it," observes Joseph Hafner at McGill University, Montreal, which uses OCLC’s WorldCat Local.

According to library director Jonathan Miller at Rollins College, Winter Park, FL, which uses Summon, "We've had a business faculty who loves it and a philosophy faculty who hates it." Depending on the subject area, experienced users may prefer a familiar discipline-specific database that produces fewer search results, while those whose topics cross disciplines are delighted to find new material.

Librarians have observed how they have gone from explaining the mechanics of search to focusing on evaluating search results. "Students are coming in with their problems rather than not knowing where to start," says ASU's Duvernay. "It's less about using the library and more about what they have found and how to effectively use it," observes Millersville's Anderson.

"We can start to move away from the mechanics of the database, and we can focus on the educational components and help students understand the difference in information objects," Anderson suggests. "Students need to think critically about what they have found rather than how to find it."

Future opportunities

As discovery tools become well established, there is the potential for them to help introduce users to new subject areas. For example, search results can be displayed visually, allowing users to navigate the literature and discover topics within it.

Vendors can incorporate new content types, such as e-textbooks and data sets, into the indexes and integrate them with learning systems. Video and image search will become smarter as more published content includes multimedia. Rapid adoption of mobile readers and tablet computers, such as the iPad, will help drive these developments.

Discovery tools are implementing mobile access, but resources that have not yet been "mobilized" can be unwieldy or unusable on a small screen.
As more publishers adapt content to personalized readers, the user experience will improve and could significantly change the way we work. Content providers will also increasingly use social networks to enable discovery through affiliation.

Going forward
While still fairly new, discovery tools are rapidly gaining content, adding enhancements, and growing their customer base. Libraries have adopted technologies that transform their services, and discovery tools are the next innovation. The unified index enables libraries to provide easier access to their resources at a time when mobile devices are beginning to change how we work. These discovery tools open the door for digital natives to encounter library-friendly services with a low barrier to entry.

When we look at the new discovery tools, we should remember what drives information decisions in our everyday lives. The new discovery tool providers would do well to note a recent observation by InfoWorld’s Robert X. Cringely on why the iPhone and iPad have enjoyed such success: “The reason? Jobs’ insistence on giving people what they really want: simple, intuitive products that are fun to use.”

Want to know more about discovery and get your questions answered?

Join LJ for a special 90-minute webinar event with some of the creators, and users of the leading discovery tools. The webinar will further navigate the discussion of discovery as reported on in a series of spring 2011 LJ articles highlighting the development and implementation of these major tools. We’ll look at how libraries are implementing discovery, how discovery is changing search, and flesh out the differences among the various products. We’ll turn the conversation over to our audience, giving participants a chance to join in the discussion.