
Journal Finder, a Second Look: Implications for Serials Access in Today's Library

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Since The University of North Carolina at Greensboro's Jackson Library introduced Journal Finder in August 2001, the service has grown and evolved. Its features and capabilities have been expanded, enhanced, and refined, and a partnership program has been developed. Journal Finder enjoys significant initial success and appears to meet a real need in the research life of faculty and students. Additionally, Journal Finder has revealed several user trends with implications for the library, including the use of print serials, photocopying, interlibrary loan, and document delivery/pay-per-view, and it continues to provide insights and data for serials collection management decisions. *Serials Review* 2003; 29:287-294.

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Two years ago The University of North Carolina at Greensboro (UNCG) launched its Journal Finder service, a program aimed at providing library users comprehensive and unmediated access to journal literature.¹ Since its introduction in August 2001, Journal Finder has grown and evolved. Over that two-year period, its features and capabilities have been expanded, enhanced, and refined. At the same time, seventeen other academic institutions in North and South Carolina have adopted Journal Finder as a primary service program, allowing users comprehensive access to journal articles, whether print or electronic, through a single interface. By these several indications, Journal Finder appears to have met a real need in the research life of faculty and students. Whether one looks at its use within UNCG, at its continued evolution and enhancement, or at its spread to other academic institutions, Journal Finder has enjoyed significant initial success. This growth and success are consistent with recent reports in the literature that indi-

cate that linking to full-text journal articles—either internally within a database, or externally from an outside source—is a burgeoning phenomenon, one that clearly suggests that information users find significant benefit in this kind of dynamic linking capability.²

User Perceptions

Journal Finder's fundamental value lies in its broad utility to information seekers. Journal literature is a primary source of information for the researcher, teacher, and student.³ Therefore, a service with a single interface, that can provide a library's patrons access to *any* journal article, whether print or electronic, whether owned by the library or not, regardless of the patron's location, is powerfully useful. During Journal Finder's brief existence, users have repeatedly commented on its value and praised its utility. For example, in a recent letter written to the library, Dr. Timothy Johnston, dean of the College of Arts & Sciences at UNCG, offered the following Journal Finder testimonial, which speaks not only to Journal Finder's helpfulness, but also to its central features:

Before Journal Finder was developed and implemented on the Library's Web page, one often had to check several indexes to determine how to access an article from a particular journal. Electronic subscriptions were generally listed only in the database through which the Library subscribed to the journal and as subscriptions changed, it became increasingly difficult to know where to look to find out if an article could be accessed electronically. For someone like myself, whose research spans several academic disciplines (psychology, biology, history,

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philosophy), it was almost impossible to stay familiar with all the subscriptions the library had available through different services. I sometimes found that I had made a needless trip to the Library, or waited for an Interlibrary Loan to arrive, when I could have accessed the article immediately from my desktop, had I known that we subscribed electronically, and been able to check the correct database.

With Journal Finder, all that has changed. All I need to do is enter the journal title into Journal Finder and I am immediately informed about all the options for accessing it. If we have an electronic subscription, one or two more clicks connect me to the service and I can be reading the article on my screen in a matter of seconds. (In some cases, links in the article I am reading will connect me through Journal Finder to full-text versions of the sources cited.) If we do not have an electronic subscription, Journal Finder tells me whether we have the print version in the library (or tells if PPV access is available); and if we do not, it connects me to the Interlibrary Loan page so that I can place an order. Journal Finder is completely transparent for the user—I can use it without knowing how we subscribe to a journal and without having to keep track of what on-line service provides electronic access to the journal I want to consult. This allows me to use my time more productively, concentrating on searching for relevant articles and reading them.⁴

Partnerships

Development of a Partnership Program

Once Journal Finder was developed and fully operational at UNCG, the staff who created the service realized that the labor-intensive activity involved in populating its primary structural component, the electronic journals database, could (and should) be shared with other libraries. For at least two reasons, this sharing seemed particularly appropriate for academic libraries within North Carolina. Because of their similar missions, these institutions would naturally have a significant amount of overlap with respect to the full-text databases they subscribed to. In addition, they all had access to a common set of electronic databases provided by a state-wide program, NC LIVE (North Carolina Libraries for Virtual Education).⁵ As a consequence, the library at UNCG developed specific forms of collaboration with other institutions for sharing the benefits of Journal Finder. These forms of collaboration have resulted in seventeen Journal Finder “partners.”

Methods of Partnership

Basically, there are two forms of Journal Finder collaboration or partnership: the consulting model and the hosted model. In the consulting model, UNCG shares all basic components of the Journal Finder service—database, database structure, tables, scripting software, etc.—with the partner institution. The partner institution then assumes responsibility for assembling these components in ways that are most appropriate for that institution. The partner institution pays a one-time fee, but ongoing consultation, upgrades, major new enhancements, etc., continue to be shared. This model was pri-

marily developed for relatively large institutions, mainly those with the technical infrastructure to operate Journal Finder independently.

As the name suggests, “hosted” partnering is a means for institutions to participate in Journal Finder in a much more supported way. On the hosted model, UNCG essentially provides the Journal Finder service for the partner institution by creating a separate database table structure for each hosted institution. Under this arrangement, UNCG furnishes all basic components of Journal Finder, including customized programming for interfaces, linking to and from external databases and online catalogs, all shared electronic journal data, all hardware and software, a sophisticated reporting module, and ongoing training and support. As collaborators, “hosted” institutions do have some responsibilities with regard to providing holdings and URL data for electronic titles not held by UNCG. They also assist with linking to aggregator products and by providing appropriate authentication capabilities.

Benefits of Partnership

For libraries that become Journal Finder hosted partners, the benefits are considerable. The overriding benefit, of course, is that they are provided “one-stop shopping” for their patrons who are seeking journal literature. Though many of the specific benefits will be explored in subsequent sections of this article, a summary listing of some of Journal Finders’ primary beneficial features will be useful at this point:

1. It includes local holdings, regional print holdings, interlibrary loan, document delivery, e-journals, pay-per-view titles (if desired), and an expanding set of free full-text journal sources.
2. It is highly customizable, with each hosted partner able to decide how it wants the Journal Finder interface to look and function.
3. It provides accurate holdings data for e-journals to which UNCG subscribes, as well as for free, high quality journals.
4. It provides alternate titles for all journals for which UNCG has e-journal or print holdings.
5. It provides all necessary hardware and software for providing the service.
6. It provides ILS and OpenURL linking capabilities.
7. It provides a number of usage reports, many of them available via real-time Web access.
8. It provides multiple forms of training and support, including on-site (if needed), telephone, e-mail, partner listserv, annual meeting, etc.

Both methods of institutional partner participation in Journal Finder involve the payment of a fee. The one-time consulting fee is based on the degree and scope of consulting needed, and thus varies from situation to situation. Hosted partners pay an annual fee of one dollar per FTE (full-time equivalent) student. University of North Carolina system institutions receive a 50 percent discount to both the consulting or hosted fee. To date,

Journal Finder has one consulting partner and seventeen hosted partners throughout North and South Carolina.

One among a Number of Link Resolver Services

As originally conceived and implemented, Journal Finder provides a single interface and service through which a library user can access journal literature, whether owned by the library in print or full-text electronic form; available from an aggregator service to which the library subscribes, through interlibrary loan or an external document delivery service; or available through pay-per-view options. In addition, Journal Finder provides links to these comprehensive access options from external reference databases, aggregator services, and from the online catalog.

Through dynamic linking using OpenURL⁶ technology, Journal Finder intends to provide comprehensive, unmediated access to journal literature in an integrated fashion. This involves linking from different points of information entrée (e.g., Journal Finder search screen, online catalog, aggregator databases, reference databases). With the continuing growth of full-text electronic journals, the utility of this type of dynamic linking is evident. Just as the demand for electronic journals has grown, the demand for dynamic linking will continue to grow.⁷ For these reasons, Journal Finder takes its place among a growing list of services that use the OpenURL framework to provide similar types of dynamic linking between information sources, such as Ex Libris' SFX, Endeavor's LinkFinderPlus, Serial Solutions' Article Linker, Innovative Interfaces' WebBridge, and Openly Informatic's 1Cate.⁸

Experiences over the Past Two Years

Because of the long period over which it was developed, calculating Journal Finder's specific, cumulative dollar costs would be difficult; nevertheless, UNCG's Jackson Library has dedicated significant resources to its creation, maintenance, and enhancement. There are the obvious costs involved in providing the necessary underlying computer hardware. Though not trivial, these hardware costs have not been high, adding little to the library's total budgeted expenditures for hardware. As server storage capacity and processor speed increase while machine costs stabilize or decline, presumably these costs will become even less of a consideration. The majority of the resources for Journal Finder have come in the form of staff time for planning and implementation. From its modest beginnings as an electronic journals database in 1998, Journal Finder has become a complex and highly integrated journal access tool. The primary intellectual force behind this creation and development has been Tim Bucknall, assistant director for Information Technologies and Electronic Resources at UNCG. In addition, several library information technology staff contributed to the technical development of its basic database structure, and they continue to provide ongoing

maintenance support as well as program enhancements. The electronic journals librarian and the serials cataloger assumed, and continue to play, key roles in providing and maintaining Journal Finder's content and its links to the online catalog.

At present, Journal Finder's maintenance and development require regular attention from at least five library staff members. Although the total amount of time devoted to Journal Finder activities varies from week to week, the average amount of time spent by each of these staff is less than ten hours per week, except for the electronic journals librarian, who often spends more than 75 percent of her time on activities related to Journal Finder. Anticipating that access to electronic journals will remain a key element in its support of academic programs, the library intends to continue indefinitely this level of staff support. This support will continue to come from the library's information technology unit, which now numbers ten full-time staff. Recognizing the critical and growing role played by technology in support of information access and creation, the library is committed to expanding its information technology unit as needed to support Journal Finder and its future evolution.

Improvements to Journal Finder

Journal Finder was never intended to be a finished product. Similar to commercial software products, library staff are continuously modifying and improving it to meet the needs of users and the partner institutions. Improvements are developed in-house and tested locally, then implemented in UNCG's Journal Finder for further testing prior to release to the partners. Of course, each partner has the option not to incorporate any of the new features into their Journal Finder.

Advanced Searching. Journal Finder now has an "Advanced Search" page, which provides more options than just the basic title search (Figure 1). The search engine was developed in-house using ASP (Active Server Pages)⁹ scripts and SQL (Standard Query Language)¹⁰ queries. Advanced searching provides the ability to search for a journal title that either "begins with" or "contains" the entered search term or phrase, search by ISSN (International Standard Serial Number), and search for titles by

Advanced Search

All Journals

Enter words in the name of the journal:

The journal title (begins with / contains)

Note: A "contains" search finds all journal, magazine, and newspaper titles that contain your word or phrase, not just those that begin with your word or phrase. Example: A "contains" search on the phrase historical journal will find both Historical Journal of Massachusetts and Cambridge Historical Journal.

Enter an ISSN:

ISSN

E-Journals Only

Choose a subject:

Subject

Figure 1. Advanced search screen (23 July 2003)

subject area. The “begins with” title search provides the same functionality as the basic search screen. The user enters as much of the beginning of the title as they wish, and Journal Finder returns any title that begins with that word or phrase. The “contains” option permits users to search for a word or phrase that is contained within any part of the title. So, for example, entering a “contains” search for “historical journal” will retrieve *Cambridge Historical Journal*, *Historical Journal of Film, Radio, and Television*, and *Loyola Student Historical Journal*, among others.

The ISSN search was developed primarily at the request of UNCG library staff. It is used as a quick method to retrieve a title when the ISSN is known. The ISSN must be entered with the dash (-), but since some of the items within Journal Finder do not have an ISSN (especially Web-only journals), ISSN searching is often not the best option.

The subject search is currently enabled for most of UNCG's journal holdings but primarily for electronic journal titles. Subject searching for journal print holdings can also be accomplished through the library catalog. Within Journal Finder, journal titles are assigned one or more of the fifty-two subject areas loosely based upon the academic disciplines at Journal Finder institutions. Selecting a subject provides an alphabetized title list of journals on that subject. This type of search can be especially useful to researchers who wish to know if the library has access to electronic journals in a particular discipline. Subject searching is increasingly vital as systems accommodate larger numbers of journals.

Alternate Titles. In order to improve the success rate for searches, alternative titles are added to the database. For example, *JAMA: The Journal of the American Medical Association* is listed within the database as any of these entries:

JAMA Journal of American Medical Association
Journal of American Medical Association
J A M A Journal of American Medical Association
J A M A
JAMA The Journal of American Medical Association

Because alternate titles are in the database, users may enter any of the title variations and still retrieve the proper record. The alternate titles are stored within the database in a secondary title field used only for searching. The title that is displayed to the user is stored within the database in the primary title field. Thus, all title variations are normalized into a single, standardized display title.

OpenURL Link Resolver. One of the major improvements developed by the Journal Finder programmers is the ability to link from a citation within one subscription database to the full-text within another subscription database using OpenURL data contained within each. For citation databases that enable a link back to local holdings, the citation database is configured to simply use the URL to link to Journal Finder instead of the library catalog. If the citation database allows the extraction of citation information as part of that URL (author, article title, jour-


nal title, volume, issue, page number, etc.), Journal Finder can accept that data and then reformat it to create a query into a full-text database to retrieve the entire article. This has worked extremely well, and has capitalized on the investment in both citation only and full-text databases. For a demonstration of how this works, please see the Journal Finder information page at <http://journalfinder.uncg.edu/demo/>.

Changes to the Database Structure. Several changes to the database structure were necessary to implement these enhancements. Only the significant changes are noted here. In the main titles table, the search title is separate from the display title to allow searching on alternate titles, but a user can still retrieve the standardized (i.e., display) title for the results list. In the electronic access table, an embargo field tracks any embargos for specific titles from database vendors. If an embargo is present, an additional note displays to the user stating “Lack most recent # months” in the “Full-Text Ends” column (Figure 2).

The source database table now also contains a “rank” and an indicator if the database is provided through the NC LIVE service. The rank specifies the display order of the source databases on the online access screen. Thus, if the library wants to point users to more comprehensive databases first, those databases rise to the top of the display list. By indicating if the source database is an NC LIVE resource, the Journal Finder administrators can more easily populate additional Journal Finders for the North Carolina partners. Additionally, two tables were added to maintain the log files. One is used to record which e-journal and source database is used. The other logs the date, journal title, and IP of the user to track on- and off-campus access.

Changes to the ASP Scripts and SQL Queries. The Journal Finder database does not accomplish much on its own; it only holds the data and provides relationships between data elements. The user needs a method to get into the data and extract what is needed. Both the Journal Finder user and administrative interfaces use ASP scripts and SQL queries to submit, search for, retrieve and display information from the database. These scripts and queries are modified as needed to add functionality based on changes made to the database table structure.

When a separate Journal Finder is created for a partner site, in addition to creating the underlying database structure, the Journal Finder programmers must also create the unique ASP scripts and SQL queries that are



Journal Title	Source	Full-Text Begins	Full-Text Ends
Science	J-STOR - General Science Collection	6/1/1980	12/31/1997
Science	Proquest Direct PA Research II Periodicals	7/1/1992	Lack most recent 12 months.
Science	Infotrac OneFile via NC LIVE	1/1/1983	Lack most recent 12 months.
Science	Ebsco Academic Search Elite via NC LIVE	1/3/1997	Lack most recent 12 months.
Science	Ebsco Health Source: Nursing/Academic Edition via NC LIVE	1/3/1997	Lack most recent 12 months.
Science	Ebsco Master File Premier via NC LIVE	1/3/1997	Lack most recent 12 months.

Figure 2. Example of embargo display (23 July 2003)

appropriate for the partner site. Through modularization of these scripts and queries, segments of the code can be used for multiple purposes and multiple sites. The code segments can then be “included” in any ASP script whenever they are needed. For example, the code that formats and displays the search results list previously was contained within both search-title.asp (used to search for and retrieve results from the Journal Finder interface) and catalog.asp (used to link from the online catalog journal record to the Journal Finder data for that title). Now the same search results code (inc-searchresults.asp) is automatically added to both of these scripts using the ASP “include” command. This enables the programmers to easily modify the single code segments, while the changes are immediately reflected in all of the pages that use them.

Changes to the Administrative Interface. The administrative interface to Journal Finder has not changed significantly. Access points, titles, subjects and electronic sources can be created, edited or marked for deletion as needed. More importantly, the modified structure permits partner sites to administer their own Journal Finders. Additionally, when a change is made to a resource within the UNCG Journal Finder, ASP scripts automatically check to see if the same resource is also provided in any of the partner’s services. If found, the scripts automatically update the partner’s Journal Finder as well.

Expanded Content

Free Resources. Journal Finder includes information about free electronic journals since there are many to be found worldwide. Currently the database has over 1,700 free electronic journals. Since these titles are publicly available, they have also been added to the partner data-

bases. In the near future this data will be used to create a publicly accessible resource specifically for free e-journal discovery. It will likely contain search features similar to Journal Finder, but have subject access as the main searching variable.

Pay-Per-View Options. During 2002, Jackson Library established electronic access to over 2,300 unsubscribed journals through several pay-per-view vendors.¹¹ UNCG’s current vendors include American Institute of Physics, EBSCO, FirstSearch, Ingenta, ScienceDirect, and Wiley InterScience. The pay-per-view titles are only included in Journal Finder if no other method of access exists or if the pay-per-view coverage dates differ significantly from other methods of access. This ensures that users do not use pay-per-view when they have the option of getting the same article via a subscription database. When users select a link to a pay-per-view resource, they are first prompted to authenticate. The subsequent steps they take depend upon the vendor, but they are ultimately provided the full-text article at no personal charge to them. The library continues to subsidize all document delivery, pay-per-view, and interlibrary loan. For the most recent fiscal year, Jackson Library spent approximately \$80,000.00 on these services.

Implications for UNCG

Administrative and Development Implications

Behind the public interface of Journal Finder lies a sophisticated administrative interface that requires a username and password for access (Figure 3). Journal Finder partners are provided with a unique administrative interface, username, and password so that they can add, delete, or edit titles and their access points and review

Journal Finder Administration



Administrative Tasks

- [Search for Access Points](#)
- [Search for Titles](#)
- [Add Titles](#)
- [Add or Edit/Delete Subjects](#)
- [Add or Edit/Delete Electronic Sources](#)

Queries and Views

- [cataloging information for all titles](#)
- [titles without a catalog date, web-only titles without a catalog date](#)
- [titles with no hard copy](#)
- [title, source, and ISSN for all e-journal titles](#)
- [titles accessed via a particular source \(tblAccessE\) or in Jackson Library \(tblAccessJac\)](#)
- [titles with multiple access points via a particular source \(tblAccessE\) or in Jackson Library \(tblAccessJac\) \(requires special authorization\)](#)
- [titles without access points \(requires special authorization\)](#)
- [titles associated with a particular subject](#)
- [titles without subjects \(requires special authorization\)](#)
- [view no-hits log](#)

Database Statistics

- [general](#)
- [e-journal access by vendor, journal access in Jackson Library's catalog](#)
- [e-journal access by location](#)
- [vendor access](#)

Figure 3. Administrative interface (23 July 2003)

statistical data. This allows each partner to customize their individual Journal Finder for their unique subscriptions. Staff members can also add subjects and new electronic sources when needed. Additionally, several administrative queries can be run against the database. For example, running the "titles accessed via a particular source" query limited to titles from the APA (American Psychological Association) PsycArticles database results in a dynamically generated list that provides this information. This is useful for quick editing of subscription changes when they are provided by the vendor.

Statistics and What They Reveal. The administrative functions of Journal Finder allow UNCG's library staff to view statistics related to access points and how users are finding resources. The general database statistics provide the total number of unique titles within Journal Finder (over 23,000 for UNCG as of 23 July 2003), the number of electronic and print access points (over 24,000 and 20,000, respectively), the number of database vendors (85), and the number of titles for each vendor.

Since all searches and subsequent selections are logged, the Journal Finder database administrator has created reports to view (1) electronic journal access statistics by vendor, (2) journal access statistics for print holdings within the library's catalog, (3) access statistics by location (to determine on- or off-campus), and (4) vendor access statistics. Not only does this provide the number of accesses for each vendor's databases (e.g., EBSCO MasterFILE Premier, 658 accesses during April 2003), but also for each full-text title within each database (e.g., *School Library Journal*, 19 accesses during April 2003). These statistics are gathered whenever a user clicks on the electronic access icon then selects a database from the resulting list. Access statistics to print holdings within the library catalog are also title specific. These are gathered whenever a user clicks on the book icon.

Additionally, authorized Journal Finder content editors can run any number of SQL queries against the data to help with administration. For example, content editors can view the cataloging information for all titles, view titles with no hard copy available in the library, view titles without subjects, and view the no-hits log. The no-hits log records the search term(s) used for each unsuccessful search. The electronic journals librarian reviews this log routinely to determine which titles may need to be ordered, which titles are associated with common misspellings or alternative word order, etc. In addition to the cumulative statistics, most of the reports and queries can be limited to specific date ranges.

Jackson Library is collecting statistics generated from Journal Finder to provide information for collection management decisions. Titles that come free with print or have an "up charge" (an additional fee for electronic access while maintaining the print subscription) can be monitored for usage. If online usage statistics are low for a title, the collection management team may choose to cancel this title. For example, the title *Macroeconomic Dynamics* has only been accessed once for the entire year in Journal Finder and will be canceled. If a title has low usage in Journal Finder, then the print ver-

sion is a candidate for cancellation if required by budgetary considerations.

Statistics are also generated on how many times a certain database is accessed through Journal Finder. These statistics can help with decisions on which databases or bundled serial collections to keep. For example, the library purchased a bundled set of titles from PsycArticles last year; UNCG's statistics show that this set of titles was used 7,385 times from 1 June 2002 to 1 June 2003. When it is time to renew PsycArticles, the collection management team will have usage statistics to justify that this product is worth renewing.

What the Log Files Show. Another feature of the administrative interface is the ability to track and view the "No-Hits" log. The "No-Hits" log contains all of the searches that have been tried from the Journal Finder search page but that were unsuccessful. This log allows the staff to view how the public is searching, what journal titles they are searching, and what patterns are emerging. The staff has used this log to refine how Journal Finder executes search queries. When a patron searches for a title, the system now strips out all initial articles ("a," "an," "the") plus any "and" and "&" from the search. For example, if a patron types in "The Journal of Aerospace & Engineering," the system automatically strips "The" and "&" from the search. The log file also indicated that titles with colons were not being found because most users typed in incorrect information after the colons. To fix this problem, the programmers decided to strip out from the search the colon and anything after it. Since these enhancements were made to the searching query, the "No-Hits" log primarily contains titles that were misspelled or titles that are not accessible either through subscription or pay-per-view.

The "No-Hits" log has also helped to identify alternative titles that patrons may search. For example, a title search for "News Week" showed up in the log file. In order for the patron to successfully find this magazine, the staff added this title as an alternate title to *Newsweek* in Journal Finder. The philosophy behind the "No-Hits" log file is to make Journal Finder work for patrons and assist them in successful queries, even when their thinking is fuzzy or their search strategy is not accurate.

Collection and Staffing Implications

Collection Management. Journal Finder has had an impact on how the library provides access to serials. Because Journal Finder offers an easy way to access journals, there has been a change in philosophy within the UNCG university and faculty. The library is now focusing on adding more electronic journals and replacing print with online-only subscriptions. Most of the library's Blackwell Publishing titles have been changed from print to online only. In fall 2003 faculty in the Department of Chemistry planned to discuss replacing all their American Chemical Society print journals with online access only. Since statistics are so easy to track in Journal Finder, the library has been able to provide faculty members with usage information about their journals.

Providing access to pay-per-view titles through Journal Finder has allowed tremendous expansion of the online collection. The electronic journals librarian has been tracking use of pay-per-view titles for over a year and recently recommended new electronic subscriptions to fifteen journals. The statistics gathered on pay-per-view titles allows collection management to discover which titles are being heavily used and are needed for the collection. In the journal *Collection Management*, Thomas Nisonger stated that "research has consistently shown, not surprisingly, that access is more cost-effective for infrequently used titles, while ownership is more effective for frequently used items."¹² The authors concur. The library purchased these fifteen recommended titles rather than continuing to provide the option to purchase individual articles.

Print Serials Use. Print serial usage has decreased in the last five years due to the increased number of journals available online through Journal Finder. The number of journals the library is subscribing to in print is decreasing while UNCG's electronic subscriptions are increasing. Throughout its history, the library has kept all current periodicals in a mediated, closed-stack area. Patrons have had to show their identification card to a staff member who then retrieves the desired current periodical. With the dramatic decline in print journal usage, there are now plans to open this closed-stack area. When these plans are implemented, most of the current periodicals service desk staff will be reassigned to an expanded access services unit.

Photocopying. Like many other academic libraries around the country, Jackson Library has experienced a dramatic decrease in the volume of photocopying done on library-provided machines. In fact, in-house public photocopying is less than half of what it was four years ago and a mere fraction of what it was eight years ago. Though electronic course reserves has contributed to this decline, the aggressive addition of electronic, full-text journals, which are easily located and accessed through Journal Finder, has been the principal cause of this reduced activity. The decline in the use of photocopiers is expected to continue over the next several years as electronic journals supplant print.

When library patrons at UNCG locate electronic articles, they can download them onto diskettes, send them to an e-mail account, or print them at a library or computer center print station. In the past, Jackson Library provided free printing for all library patrons. In fiscal year 2002–2003, direct costs (i.e., printers, paper, toner) for providing "free" printing were approximately \$25,000.00. Beginning in August 2003, charges for public printing were implemented with a double-sided page costing six cents.

Interlibrary Loan. With the option for interlibrary loan prominently displayed with all search results, the library staff was concerned that interlibrary loan article borrowing requests would increase. On the contrary, UNCG library statistics show a decrease in article requests since Journal Finder was introduced. When the ar-

ticle request statistics for the two years prior to Journal Finder implementation were compared to the two years following implementation, one can see a decrease of 12.2 percent in article requests. The library staff believes that this decrease in interlibrary loan requests is due to the introduction of Journal Finder and the access to pay-per-view titles.

Document Delivery and Pay-Per-View. Document delivery is also a prominent option available through Journal Finder. This year articles ordered through an unmediated document delivery service have increased 26 percent, from 1,465 in 2000–2001 to 1,981 in 2002–2003. Additionally, pay-per-view options were introduced in Journal Finder in January 2002, and continue to be popular with patrons. Since January 2002, over 1,750 articles have been delivered through pay-per-view. The electronic journals librarian is continually monitoring the use of current pay-per-view titles and is adding titles to Journal Finder as they become available.

Staff Changes. Staff responsibilities have shifted over the past two years, but no additional staff has been hired. The electronic journals librarian now works with an assistant whose main job responsibilities are to add, delete, and edit content. This assistant also monitors and tracks pay-per-view usage statistics. The serials cataloger and the assistant serials cataloger now spend over 25 percent of their time cataloging the electronic journals added to Journal Finder. In the 2001–2002 academic year, they cataloged 2,771 new electronic journal titles. In the 2002–2003 academic year, they cataloged 4,169 new electronic journal titles, an increase of 50.4 percent in one year. A single bibliographic record is used for each title regardless of journal format.

Looking to the Future

When Journal Finder was introduced in 2001, library staff expected that patrons would find the service helpful. Usage figures gathered and user comments provided since its introduction overwhelmingly support this expectation. During typical activity periods in the fall of 2002, Journal Finder was searched nearly 50,000 times per month by information seekers at UNCG, signaling robust activity. In addition, user comments collected in spring 2003 as part of a comprehensive service quality survey (Lib QUAL+)¹³ indicated high levels of enthusiasm for Journal Finder. Comments such as "Journal Finder is a great tool" and "Journal Finder is sensational" were representative of user perceptions and reactions about its utility. Based on these usage figures and comments, as well as the numerous other testimonials that have been personally presented to staff, the library is confident that Journal Finder has been a hugely successful public service program. In addition, its ability to provide sophisticated use statistics has made it a boon for administrative decisions about both print and electronic resources.

At its introduction, however, there were matters about which library staff were not so sanguine. For instance,

questions arose about whether local users would come to the library to use print holdings or choose delivery of a print article to their homes or offices through unmediated document delivery. Also unclear was whether patrons would choose unmediated document delivery through a private information broker, resulting perhaps in steep declines in interlibrary loan activity. There was also the question of whether the unconstrained offering of pay-per-view titles through Journal Finder would result in large numbers of pay-per-view requests, thereby rendering this option impossible to support financially. Though it has only been two years since Journal Finder was introduced on UNCG's campus, limited, initial data now exists to examine impact in these areas as described in this article.

As indicated above, although UNCG continues to see moderate use of unmediated document delivery through a private information broker service, the amount of use has not changed significantly. And, interlibrary loan borrowing activity has declined over the past four years. On the other hand, the library is experiencing higher costs with regard to pay-per-view provision. This was expected and is attributable to the fact that pay-per-view is a convenient and immediate form of access to needed information and to the fact that a considerable number of pay-per-view titles have been added to Journal Finder as access options. Even though the pay-per-view costs to the library have risen, they are well within the levels expected and are partially offset by print journal cancellations.

The Journal Finder staff is considering several types of improvements for Journal Finder. In an attempt to make its search interface and subsequent Web pages as intuitive and navigable as possible, Journal Finder will soon undergo thorough usability testing. At the same time, efforts will be made to give it the capability to automatically populate interlibrary loan forms with article information that is extracted from citation databases. Such a feature should result in improved efficiency and effectiveness for interlibrary loan operations. Finally, though the forms of several planned improvements are presently vague and inchoate, the linking capabilities made possible through the use of OpenURL have the potential for significant future enhancements to Journal Finder.

Through its first two years, Journal Finder has demonstrated its worthiness and fidelity to its original purpose: providing users direct, unfettered access to all journal literature through a single, integrated interface, independent of the user's location. This has occurred without dramatic or unanticipated increases in funding for support of the free access to journal articles that it furnishes.

As the amount of journal information in electronic format increases, the authors anticipate that the transparent and seamless linking between resources that Journal Finder provides will also increase, as will its centrality to Jackson Library's basic aim of supplying core and peripheral journal literature to its users.

Notes

1. For a detailed explanation and description of the Journal Finder service, its programmatic intent, features, capabilities, technical components, and structure, as well as ruminations on its future implications, see Terry W. Brandsma, Elizabeth R. Bernhardt, and Dana M. Sally, "Journal Finder: A Solution for Comprehensive and Unmediated Access to Journal Articles," *Serials Review* 28, no. 1 (2002): 13–20.
2. "Article-Level Linking into JSTOR Reveals Interesting Trends," *JSTOR News* 7, no. 2 (2003): 1–3.
3. Brandsma, "Journal Finder," 13–14.
4. Timothy D. Johnston, a letter to UNCG's Walter Clinton Jackson Library, 24 February 2003.
5. Further information on NC LIVE can be found at <http://www.nclive.org/> (10 September 2003).
6. For additional information on OpenURL, see Harry E. Samuels, "What is an OpenURL?" 2002, http://www.endinfosys.com/pdf/openurl4_02.pdf (10 September 2003); Mark Needleman, "The OpenURL: An Emerging Standard for Linking," *Serials Review* 28, no. 1 (2002): 74–76; and the SFX OpenURL Website at <http://www.sfxit.com/openurl/> (10 September 2003).
7. For a comprehensive review of information format trends, including scholarly electronic journals, see OCLC Reports, "Five-Year Information Format Trends," March 2003, <http://www.oclc.org/info/trends/> (10 September 2003).
8. For reviews of several link resolver products, see Jill E. Grogg and Christine L. Ferguson, "Linking Services Unleashed," *Searcher: The Magazine for Database Professionals* 11, no. 2 (February 2003): 26–31; and Sjoerd Vogt, "Resolving the Links," *Information Today* 20, no. 4 (April 2003): 25–26.
9. Further information on ASP can be found at <http://msdn.microsoft.com/asp/> (10 September 2003), as well as many other Websites, including <http://www.asp101.com/> (10 September 2003), <http://www.learnasp.com/> (10 September 2003), and <http://www.aspfaqs.com/> (10 September 2003).
10. Further information on SQL can be found at many places on the Web, including <http://www.sqlteam.com/> (10 September 2003), and <http://www.sqlcourse.com/> (10 September 2003).
11. For a vendor's perspective on pay-per-view, including general information on how pay-per-view services operate, see Sharon Cline McKay, "E-Business for E-Journals: Article Pay-per-View," *The Serials Librarian* 38, no. 1/2 (2000): 101–5.
12. Thomas Nisonger, "Accessing Information: The Evaluation Research," *Collection Management* 26, no. 1 (2001): 13.
13. Further information on LibQUAL+ can be found at <http://www.libqual.org/> (10 September 2003).