An environmental scan of next-generation discovery interfaces

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# Structured Abstract

## OBJECTIVE

The objective of this project was to perform an environmental scan of next generation discovery interfaces. This included determining what products and features are currently available as well as exploring NLM’s needs in order to make recommendations for an improved portal to NLM’s varied resources. Currently, the information stored in NLM’s collections can be accessed through several different interfaces, including LocatorPlus (the Voyager OPAC), the NLM Catalog (in NCBI’s Entrez system), the NLM Gateway portal, and, in the future, the Fedora digital repository front page.

## METHODS

Over the course of several months, information was collected on different discovery interfaces through a variety of means. Vendor sites, blogs, conferences, gray literature, peer-reviewed articles, and other websites were found through various means, including database searches, conference attendance (e.g., Computers in Libraries), suggestions from the project leaders, by monitoring listservs (code4lib and NGC4LIB), and by “berry-picking” (many of the identified products were uncovered by perusing Marshall Breeding’s Library Technology website, for example). These sources were used to identify specific interfaces, provide examples, and to generalize current practices. Any websites that were deemed useful or potentially useful were collected in a Delicious (an online bookmarking website) account. Article citations found in library literature databases were collected using EndNote Web. In addition, the author identified and interviewed key players both inside and outside the National Library of Medicine with the help of the project leader. Trends were identified by compiling the interviews. Information was also gathered on the National Library of Medicine’s current catalog interfaces informally through NLM’s fact sheets and the interfaces themselves.

## RESULTS

At final count, the scan resulted in a bibliography of 16 items, a recommended reading list of about 99 items, 6 internal interviews, and 3 external interviews. In addition, about 80 websites have been collected in Delicious, including example library catalogs, platform documentation websites, and related blog posts. This collection of websites may continue to grow as future work on an NLM discovery interface progresses. A comparison of features and which discovery platforms include them also resulted from this scan. The most pervasive theme found throughout is the call to design library catalogs that are intuitive to users; i.e. that work similarly to other commonly used web discovery interfaces (Google, Amazon.com, etc.). Associated with that theme is the request for features such as spell-checking, the inclusion of book covers, faceted search results, and the idea of a “one-stop shop.”

## CONCLUSIONS

The findings of this scan support the idea that the National Library of Medicine can and should move towards improving its discovery interface in order to aid users in their quest for information and to expose NLM’s unique collections. There are numerous options available, both from commercial vendors and community-supported open source projects. NLM, with its strong technical capabilities and staff strengths, may do well to explore an open-source solution that can be manipulated in house. However, the key to making a decision will be to solidify which features are the most important and to do a cost-benefit analysis. User studies should also be encouraged, especially since NLM’s users are difficult to define. Finally, NLM should work to stay informed of trends and to be actively involved in discussions on discovery interfaces.

# Introduction

Library catalogs have traditionally been the tools users go through to gain access to library collections. There have been several incarnations since the beginning of their existence, from bound lists to card catalogs to the online public access catalogs (OPACs) most often used today. The National Library of Medicine’s catalog has gone through the same progression, starting with the printed Index Catalogue in 1880 (which continued in series until 1961 [5]), moving to the card catalog, and finally switching to online access only in 1981. Unlike most libraries, however, NLM currently has three different online access points: LocatorPlus, the NLM Catalog, and the NLM Gateway. These three portals ostensibly allow users to discover the same set of data (bibliographic records of materials that NLM owns) in different ways. But it is becoming apparent that users may actually be more interested in just the opposite: they want to discover different types of information in one place. NLM is therefore faced with the questions of what the next generation of the catalog will look like, and what it will contain.

## Frontend/Backend

When working with library catalog products, it becomes important to distinguish between the “frontend” and the “backend” of a system. The backend of the traditional integrated library system (ILS) consists of the system components (or modules) that are specifically for staff use, e.g. the cataloging and acquisitions modules where item data is entered into the system. The frontend is the public interface that library users interact with, and is often referred to as the “Online Public Access Catalog” or OPAC. The frontend, in other words, is where users discover a library’s resources.

For some time, the ILS has been treated (both by the vendors that create them and the librarians who use them) as one product. Recently, however, there has been a push to separate the various parts, and especially the frontend from the backend. The public interface is dependent upon the data from the backend modules, but more and more products are being offered that can pull that data out and push it to users in new ways independent of the backend (although there are also new proprietary frontend discovery products that only work with a specific vendor’s systems). As Mark Andrews states, “We should no longer speak of the ‘ILS’ as a stand-alone product (if, in fact it was ever a truly stand-alone product)” [6].

## Objective and Goals

The distinction between the frontend and the backend provided the scope of this project, which was to look solely at the frontend and to consider the needs of users in their attempts to discover and access NLM’s resources. The main objective, working within this scope, was to perform an environmental scan of next generation discovery interfaces. This objective is also part of the NLM Library Operations (LO) Strategic Planning initiative, as recommended by the Collection, Preservation, and Access working group.

The scope and objective of this project (and the LO Strategic Planning initiative) was motivated by several factors. First, NLM is looking into updating its current, older systems. Second, there is some interest in incorporating new features to improve user experience (for example, Web 2.0 features like Delicious.com bookmarking). Finally, there is a desire to provide a comprehensive interface to LO collections. There are currently multiple interfaces and many different silos of data, including the traditional bibliographic catalog, full-text documents, and various digital collections. LO is interested in providing a single discovery interface that could offer a wide range of discovery and delivery experiences.

Given this objective and considering its motivations, the primary goals of this project were to determine what products and features are currently available, and to explore NLM’s needs in order to make recommendations. It was not a goal to evaluate the current systems.

## LocatorPlus/NLM Catalog/NLM Gateway

Although their evaluation was not part of this project, it was felt that some background knowledge of current NLM interfaces would be helpful. This preliminary scan focused on the three interfaces that provide access to NLM traditional bibliographic data (i.e. the records for items entered into NLM’s backend cataloging module in the Voyager ILS system), although there are additional interfaces including the History of Medicine Division’s images database and the online IndexCat.

LocatorPlus is the current Voyager ILS (a product of Ex Libris) OPAC. It is the default bibliographic interface for NLM Reading Room users, and has been since 1999 [2]. It is also used by users outside the library, who can access it through the NLM website. According to the NLM Fact Sheet, LocatorPlus should be searched to “find unknown author or organization name…find NLM holdings…view or use bibliographic records in MARC 21 format” and to “view or use authority records for names and titles” [3]. Before LocatorPlus, NLM users were served by the Locator Catalog, developed in-house by the Office of Computer and Communication Systems on top of the Grateful Med service and implemented in 1993 [1]. Eventually it was determined that Locator should be replaced with an out-of-the-box solution that would provide both a user interface and the back-end systems required by staff to process the collections. Locator was not the first online catalog at NLM, however; that distinction belongs to the Current Information Transfer in English (or CITE), developed in SIS. CITE, a natural-language search-based catalog, replaced the card & microform catalogs after a comparison with the “ILS” system from Lister Hill in 1984 [20].

The NLM Catalog was released in 2004 in order to provide some capabilities not possible through the LocatorPlus catalog. It is an in-house product and is part of the Entrez suite of databases that includes PubMed, and can again be accessed from the NLM website. It searches the exact same set of bibliographic records that LocatorPlus searches. However, the records are updated on weekdays, rather than continuously as they are in LocatorPlus. Some key advantages of the NLM catalog are the ability to explode the Medical Subject Headings (MeSH), which searches for all MeSH found underneath a given term in the hierarchy (e.g., recovering items assigned the term “Asthma, Exercise-Induced” as well as “Asthma”) and the ability to retrieve more than 10,000 records [14].

The NLM Gateway searches across multiple resources, including the bibliographic information that LocatorPlus and the NLM Catalog use. These additional resources include Medline Plus, ClinicalTrials.gov, and Profiles in Science. The Gateway was released in 2000, and it was designed to be a “one-stop shop” for users who may not know with which information resource to start [4]. Developed by the Lister Hill National Center for Biomedical Communications, it is another in-house product and is built upon existing, and constantly changing products (like PubMed and Medline Plus), making it a challenge to create new features on top of maintaining the current [16].

These three interfaces serve different needs and have varied strengths and weaknesses without much overlap beyond the fact that they all allow users to search and discover a certain set of NLM resources. It makes sense to give users the option of discovering NLM’s resources through one interface that can meet the needs addressed by these three separate interfaces, and perhaps go even further.

# Methodology

The methodology for this environmental scan consisted of three main components: a literature review, a website review, and interviews. The information from these efforts was collected for the purpose of comparing interfaces, uncovering trends, and identifying key players (both people and platforms).

## Literature Review

There is a large amount of information available in books and journals on library interfaces. However, it was decided for the purposes of this scan that the literature review would be limited to searching library literature databases for the most recent journal articles specifically about next generation discovery interfaces. Furthermore, to limit the amount of time spent waiting for interlibrary loans, the majority of the articles chosen for the scan were those available electronically, either freely through the publisher or through NLM subscriptions.

The two library literature databases available at NLM and used for this project were Wilson Library Literature (through Ovid) and Library, Information Science and Technology Abstracts (LISTA, through EBSCOhost). Literature searches were done on both databases using a variety of terms such as “catalog” or “interface” and “new,” “next,” or “discovery.” In addition, a e-mailed search alert for new articles in LISTA was set up through EBSCOhost using the following search string:

(( ( DE "ONLINE library catalogs" ) AND ( next OR new OR "open source" OR trends OR future ) ) OR ( ( catalog OR interface ) AND ( discovery OR "next generation" OR "next gen" ) ))

Although not all articles retrieved through these database searches were read and utilized for this scan, those that were also occasionally provided additional resources in their bibliographies.

All of the citations found in these searches were collected in EndnoteWeb and were divided into two groups: those that were referenced for the scan (bibliography), and those that were not and may be considered recommended reading (see Appendix I).

## Websites

The website component made up a large part of this environmental scan, both in terms of time taken to find and collect websites, and in the amount of content collected. In general, this part of the scan was informal, rather than systematic, and was approached as a way to get a good idea of the range of information out there, rather than to try to find everything.

Word of mouth was the primary method for finding websites. Through conversations and e-mails with project leaders and others involved with or interested in the project, sites such as Marshall Breeding’s Library Technology site were uncovered. This site in particular led to a lot of “berry-picking” or jumping from one resource to another through citations and other links (a model put forth by Marcia Bates of UCLA). Search engines (specifically Google.com) were used primarily to find home pages for specific products, and occasionally to find example libraries. Conference sessions and panelists also provided a few websites in relevant sessions: the conferences attended over the course of this project were Computers in Libraries, the Medical Libraries Association, and the Special Libraries Association. Finally, three listservs yielded additional websites (either directly, or by mentioning a specific implementation that was found via Google): code4lib, NGC4LIB, and the ALCTS forum (a listserv that is moderated and centered on specific topics for a set amount of time).

The websites have been collected on Delicious.com, and the list of sites may continue to grow as the project leaders see fit. Delicious allows for tagging, which was utilized, but it was the informal system of a single person, and it is likely it was not used consistently. However, every website was assigned at least one of the tags of “resource” or “example,” with additional tags assigned to provide additional information and the ability to group sets of websites.

## Interviews

The decision was made early on in this scan that it would be beneficial to speak with both NLM employees and people from outside NLM who could give perspectives on the current status of next generation discovery interfaces. The internal interviews were conducted primarily to get an idea of perceived NLM needs and to get a better picture of what other NLM employees were seeing regarding these systems.

The selection of candidates for both internal and external interviewees was established through discussions with the project leaders. Internal candidates were chosen to represent a wide spectrum of positions within LO and all had some form of interaction with the public. External candidates were chosen individually, and represented interface implementer, interface creator, and expert opinion.

The interview questions came from a combination of discussion with the project leaders and Karen Calhoun’s report for the Library of Congress: “The Changing Nature of the Catalog and its Integration with other Discovery Tools” [11]. This report was looking at trends in interfaces across the library world, so the questions were chosen as a loose base and tweaked to match the specific interests in NLM needs and priorities.

**Internal Interview Questions**

1. How could a new NLM discovery interface maximize its utility for the communities and users served by NLM? (and please describe the specific communities and users
2. What should be included in the library catalog and why?
3. What if any are the library online catalog’s unique benefits to information seekers?
4. What specific features would you like to see included in a new interface?
5. Should NLM “push” its content out to users? If so, where and how?
6. Can you name some implementations of nextgen discovery interfaces that you’ve liked?

**External Interview Questions**

1. How do next or new generation interfaces maximize their utility for users?
2. What can be found through your institution’s discovery interface? Why were those types of objects chosen?
3. What benefits are there in the discovery interface for information seekers as opposed to the old system/OPAC?
4. What features are the most popular/helpful? What’s missing?
5. Does your institution push its interface/content out on the web? If so, where and how?

# Results

## Literature & Websites

The collection of literature and websites resulted in a large set of resources. A total of 22 articles and reports (including a few websites) were used to create the bibliography for this report. There is an additional recommended reading list of 76 articles, 37 of which are press releases and announcements providing examples of products and implementations, and 39 of which are research articles that may provide useful background information for further work. (See Appendix I for this list of readings.)

The 16 articles found in the bibliography include those used for other sections of this report, such as the Index Catalogue information in the Background section. However, nine of these articles yielded results in the form of quotes that informed the discussion and recommendations included in this report. For example:

| Articles | Report |
| --- | --- |
| Andrews, M. “Changing markets, changing relationships” [6] | “That ‘new thing’ is not an ILS with the OPAC as the pinnacle of public access tools. I see that ‘new thing’ as some combination of 1) Open URL Link/Resolver…3) Digital archive, institutional repository and portfolio products…” p. 573  “Software users should be drawn into the documentation, help and support process wherever possible, and actively encouraged in their efforts to the point of offering some tangible compensation, say lower support costs, without necessarily being employed by their vendor.” p. 574 |
| Antelman, K. “Towards a twenty-first century library catalog” [7] | “It is particularly sobering to revisit one system that was developed between 1979 and 1983. The CITE catalog, developed at the National Library of Medicine, incorporated many of the features of the Endeca-powered catalog, including suggesting (MeSH) subject headings, correcting spelling errors, stemming, as well as even more advanced features, such as term weighting, keyword suggestion, and ‘find similar.’” p. 128  “The principle functionality gained by implementing an advanced search-and-navigation technology such as the Endeca IAP falls in three main areas: relevance-ranked results, new browse capabilities, and improved subject access.” p. 129  “But since so much of the implementation involved uncharted territory, plans for assessment began before the launch of the interface…” p. 133 |
| Bowen, J. “Metadata to support next-generation library resource discovery: lessons from the eXtensible Catalog, phase 1” [9] | “XC [eXtensible Catalog] will provide easy access to all resources (both digital and physical collections) and will enable library content to be revealed through other Web applications that libraries may already by using.” p. 6  “Unlike a current ILS, where we often think of metadata as mostly static unless it is supplemented by new, updated, and deleted records, we should instead envision the metadata in a next-generation system as being in constant motion, moving from one environment to another and being harvested and transformed on a scheduled basis.” p. 9  “To present library resources via the Web in a manner that users now expect, library metadata must function in ways that have never been required of it before.” p. 15 |
| Breeding, M. “Next-generation library catalogs” [10] | “To be taken seriously by users, the catalogs and other interfaces offered by libraries need to operate with the same levels of style and sophistication as other popular web destinations.” p. 6  “In an ideal library interface, print and electronic content would stand on equal footing.” p. 7 |
| Calhoun, K. “The changing nature of the catalog and its integration with other discovery tools” [11] | “Today, a large and growing number of students and scholars routinely bypass library catalogs in favor of other discovery tools, and the catalog represents a shrinking proportion of the universe of scholarly information.” p. 5  “At a minimum, research libraries need first to explore extending the life of the catalog through innovation and cost reduction and second, to develop new uses for catalog data for existing catalog users.” p. 12  “Interviewees tended to agree that a more seamless approach to the serial literature is needed, allowing users to look in one place for books, serials and articles.” p. 35  “…for a number of interviewees, the question of the catalog’s integration with other discovery tools orbited around getting a Google user from Google to library collections.” p. 37  “At the same time, the new NCSU catalog is limited in scope to NCSU’s library collections; it has not diversified its functions to cover more of the scholarly information universe. It does not merge the ILS finding function and metasearch, nor does it support a variety of metadata types. It does not interoperate with the campus learning management system or enable users to search library data directly from external search engines or portals. This is not to be critical of NCSU’s highly praiseworthy achievement, but to suggest the scope of the problems that remain to be solved.” p. 42 |
| Hutton, J. “Academic libraries as digital gateways: linking students to the burgeoning wealth of open online collections” [13] | “By paying attention to metadata digital resource cataloging developments, participating in collaborative projects supporting resource discovery tools, and taking part in early adoption of appropriate e-resource search software, which integrate with the library catalog, academic libraries can fulfill the vision of a digital gateway for distance learners.” p. 505 |

| Mi, J. “Revitalizing the library OPAC: interface, searching, and display challenges” [15] | “Researchers do not need to take information literacy classes to learn how to use an online search engine. They do not need to worry about forgetting important but infrequently used search rules or commands. In addition, the search results delivered by online search engines are sorted using relevance ranking systems that are more user-friendly than the ones currently employed by academic library OPACs.” p. 5  “Academic libraries should aim toward designing a user-centered, self-sufficient, twenty-first-century online catalog that fits the Web 2.0 model. The ultimate goal is that users will be comfortable and confident using library OPACs for their information needs wherever a computer is available and without special training.” p. 17-18 |
| --- | --- |
| Olson, T. “Utility of a faceted catalog for scholarly search” [17] | “If faceted navigation can better match consumers to the goods that they specifically are interested [sic], perhaps libraries can expect similar results in matching scholars to the research materials that best fit their specific needs.” p. 551  “It is interesting to consider why our subjects seemed more willing to perform less precise searches than previous research would suggest…More speculatively, we are now seeing a generation of scholars whose search behaviors were first formulated on the web. It will be interesting to see whether future research on domain experts reveals a generational change in search strategies…Do web-based searching and faceted environments make less precise strategies acceptable to domain experts, or otherwise change their expectations of search engines?” p. 558 |
| Singer, R. “In search of a really ‘next generation’ catalog” [21] | “An environmental scan of all the options certainly finds more similarities than differences: facets, dust jackets, user-created tagging, bookmarkable URLs.” p. 139-140  “As much of an improvement as these OPAC replacements are…, they are all still based on some fundamentally flawed principles: *They are all still relatively closed-world silos intended to index MARC records*.” (emphasis author’s) p. 140  “…it is time to shed the trappings of the card catalog and reconfigure our assets to work with the Web instead of around it. Until we start to work with the data as they is [sic] intended, rather than how they have traditionally been structured, these next-generation tools that we find so innovative will merely underwhelm.” p. 142 |

In addition, 87 websites have been collected and saved to Delicious.com (see Appendix II). The collection of websites may continue to grow as future work on an NLM discovery interface progresses (also see Appendix II for instructions on how to log into account and how to save bookmarks). As mentioned in the methods section, the websites collected in Delicious.com were assigned tags. Currently, 53 of these are tagged as “resource” (which includes blog posts and platform/vendor description sites) and 37 are tagged as “example.” There are three websites that were considered to be both resources and examples (two of these are lists of examples). The example websites were vital in making recommendations, but they are considered dynamic and may look different in the future, so an additional result was the screenshot capture of three specific libraries (for the sake of keeping the length of this report manageable, not every example was captured) in Appendix III.

## Interviews

Six internal interviews and three external interviews resulted from this project. These interviews yielded common themes as well as unique and individual thoughts. The results below list some of these themes and thoughts, but it is recommended that the individual interviews be read in their entirety for a complete picture of these discussions. For a compilation of the internal interviews arranged loosely by theme within each question, see Appendix VI, “Compiled Interviews.” Appendix V also includes the transcripts of all individual internal interviews, while Appendix VII contains the transcripts of all individual external interviews.

### NLM Staff

Common themes appeared in the answers to all of the six questions asked of the internal interviewees. The first question, on maximizing the utility of a new NLM discovery interface, yielded three distinct groups of responses. The first revolved around a new interface’s appearance and user experience. The interviewees mentioned different specifics, but the consensus was that a new interface should cater to users’ expectations in terms of look and feel. The second theme was the organization of the interface, which the interviewees agreed could use updating. One interviewee specifically mentioned the use of facets, while another noted that a lot can be done with MARC records generally. The final theme involved the second part of the question, which was to describe specific communities and users. The “theme” in this case was actually the lack of one; basically every interviewee had a different idea as to who NLM’s users actually are. It appeared that NLM staff thought of potentially anyone as a user.

The second question, on the scope of a new NLM interface, also resulted in a near consensus that NLM should provide a “one stop” interface to its different silos (one interviewee further clarified by stating specifically that it should include only NLM information and not search across other institutions’ collections). However, one person noted that at one point, different types of objects were included in Voyager, but were later split off. Another comment in response to this question was to utilize NLM’s Medical Subject Headings (MeSH), specifically as is done in the NLM Catalog currently through “exploding.” The third question, on the benefits of an online catalog, was similar in that the interviewees came to a near consensus in that there are certainly benefits (providing an inventory, giving access to items, authoritative and curated collections), but with one comment being that the actual word “catalog” should no longer be used.

The results from the fourth question on specific features to include in a new interface included numerous responses from those who would like to see 1) spell-checking, 2) visuals, 3) “Web 2.0”/community features such as tagging and reviews, 4) integration with other sources (clinical trials, tables of contents, and full text links being specifically mentioned), and 5) facets. Other suggestions included keeping an advanced search and leveraging Vivisimo, the search engine behind Medline Plus and the NLM homepage, for better search within the catalog.

Responses to the fifth question on pushing NLM content out to users were divided into two general types: developing some type of relationship with outside indexes, and targeting specific audiences. Outside index responses included allowing Google and Open Archives Initiative harvesters like OAIster to harvest individual records, and becoming more involved with WorldCat.org and Hathi Trust. Targeting specific audiences is the other side of the coin – instead of allowing other entities to come in and take data, these responses were geared towards reaching out to groups like clinical trial patients and research grantees with appropriate RSS feeds and providing new book lists.

The final question on specific implementations resulted in numerous examples of specific systems and specific libraries. There were also a couple of examples from outside the library world, including the Canon website and iGoogle. The open source system Blacklight, Ex Libris’s Primo, and the Endeca product were all mentioned by more than one person. Specific libraries mentioned were Johns Hopkins and the National Library of Australia.

### Outside Interviews

The outside interviews did not necessarily result in trends as did the internal interviews. Each interviewee brought different thoughts to the table: Kristin Antelman as interface implementer, Bess Sadler as interface designer/implementer, and Marshall Breeding as an expert opinion on the subject as well as implementer.

Kristin Antelman discussed relevancy ranking, facets, and the “look and feel” of the interface as ways discovery interfaces maximize their utility. She also noted that it has been difficult to tell what features are popular, given that her institution has not been able to undertake appropriate usability testing. Finally, she wrote about WorldCat.org/WorldCat Local as serving the important function of giving outside users access to an institution’s collections and that local catalogs may not be the way to go any longer.

A few of the notable results from the conversation with Bess Sadler included several mentions of relevancy ranking and her explanation of how Blacklight’s ability to respond to users’ changing needs improves the interface’s utility. She noted that the interface includes “anything that the library decides it wants its users to find.” She also went into detail on the use of permanent URLs in response to the question on pushing out content.

Marshall Breeding’s responses also provided unique results. First of all, he brought up the fact that the terminology is a bit of an issue, and suggested referring to the up-and-coming interfaces simply as “discovery interfaces.” He also discussed relevancy ranking (making it a common theme among the three external candidates), facets and visual appeal as key features of discovery interfaces. Speaking as an interface implementer, he described the objects that Vanderbilt makes available through its Primo interface, and went on to state that “those objects were chosen to be made more discoverable.” Further discussion centered on the new “web-scale indexing” (huge, single indexes acting as catalogs, as in Serial Solutions’ Summon), and how the “next step may be to include the full text” in search indexes. He indicated that libraries need to be a part of this and not let Google have all control. Finally, he went over his strong interest in the pushing content out on the web, especially by providing permanent URLs, but stated that “the goal shouldn’t be for library content to be found solely through search engines.”

## Discovery Interfaces

By the end of this project, 17 different interfaces had been examined (see Appendix IV). After removing the open source full ILS products Evergreen and Koha, the 15 remaining interfaces were compared side by side on the features available in each (Appendix V). Two of these 15 interfaces were not found yet in any implementation and had limited available information: Agent Iluminar and OCLC’s TouchPoint.

The twelve features pulled out in Appendix IV’s comparison were identified from conversations with project leaders as well as the interviews, literature searches, and websites. Summarizing the results of this comparison, six interfaces had an advanced search, five had limited browse capabilities, 10 could handle multiple sources (e.g., repositories), 12 used relevancy ranking, 13 used facets, 14 had visuals, 11 included spell-checkers, 3 included information from outside sources (and 2 more pushed to outside content rather than bringing it in), 5 addressed accessibility (section 508), and 11 were ILS independent (i.e., could be used on top of other ILS system).

One feature that was not documented in these results was the presence of a simple search box (such as those available through search engines). It was informally noted that the 15 interfaces with available examples all did indeed have the simple search box feature, but this should double-checked.

About half of the interfaces included a large number of the identified features. Primo had the highest at 9.5 (it does not bring in outside sources, but it does push out to them for the .5); AquaBrowser, Endeca, and VuFind all had 9, and the Blacklight, Encore, LS2 PAC, and WorldCat Local interfaces all had 8.

# Discussion

The results outlined above may prove helpful in dialog on discovery interfaces at NLM, and they provide starting points for discussion within this report. For example, the most pervasive theme found during the scan was the call to design library interfaces that are intuitive to users. Throughout the literature, websites, and interviews, the idea came up that users expect to be able to use library catalogs the same way that they use the rest of the internet. Additionally, the internal interviews specifically signified that the National Library of Medicine should indeed move towards improving its discovery interface in order to aid users in their quest for information and to expose NLM’s unique collections.

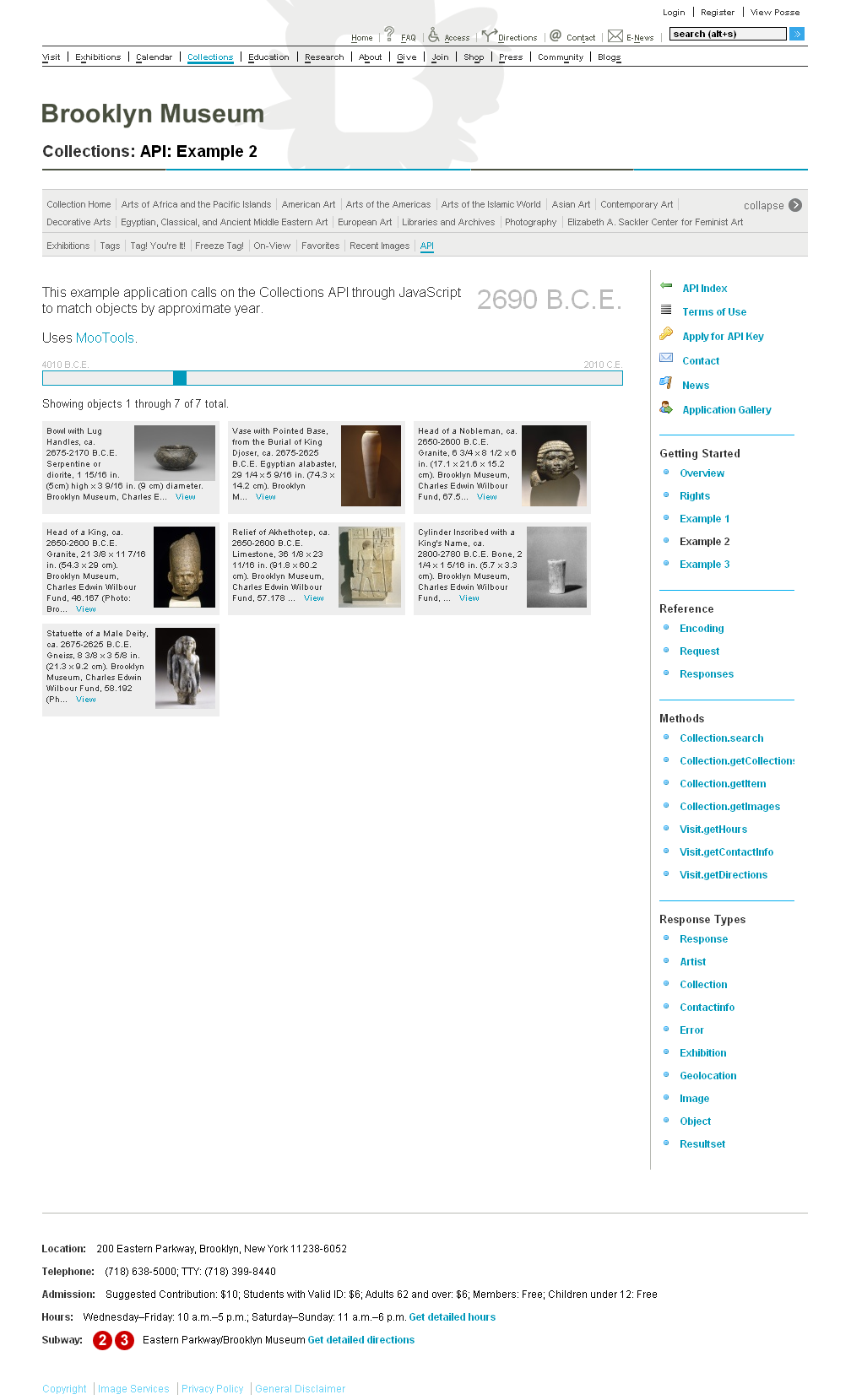
As an environmental scan of a new area of interest at NLM, this project did not necessarily lend itself to uncovering unexpected results. However, in addition to the two important, but more general, points in the preceding paragraph, a few areas for specific discussion materialized.

### Accessibility/Section 508 Compliance

As the new discovery interfaces are developed and implemented, issues regarding Section 508 compliance will need to be addressed, especially since NLM is a government organization and is publicly funded. It may turn out that this aspect of discovery interfaces will be recognized by the vendors and that new technologies will make it easier to comply, but an article found in the literature revealed that there are concerns. As Peggy Shaughnessy states, “The three primary barriers to accessibility are an overemphasis on visually enhanced design, a lack of adherence to accessibility standards, and new underlying technologies that are not yet accessible for all users” [19].

### APIs

From the onset of the project, there was an interest in the potential of “Application Program Interfaces” or APIs to provide new discovery tools. Roy Tennant explains that APIs are “simply a way for one software program to interact with another through a standard protocol” [22]. Tennant goes on to state several benefits of using APIs – of note is his comment that “*It provides a way for others to help you* [emphasis Tennant’s]*.* Z39.50, and SRU which is replacing it, are both APIs, and they allow all kinds of discovery services that would not be possible without them. OAI-PMH is another. These APIs allow for various information aggregation and/or discovery services to be created on your behalf” [22]. APIs are being used all over the internet for various purposes, including at the Brooklyn Museum, where their data is being manipulated through an API to create unique discovery interfaces, such as a timeline:



<http://www.brooklynmuseum.org/opencollection/api/docs/example_2>

As a final note on APIs, Marshall Breeding recently sent out a request through the NGC4LIB and code4lib listservs for feedback from libraries that are using APIs with their ILSs to meet specific needs. He is preparing an article that may provide additional useful information on APIs and how libraries are using them.

### Content Visibility

Karen Calhoun, in her report on the changing nature of the catalog, brought up the issue of making library information findable through external search engines and other sites [11]. Doing so enables users (who may not know of a particular library, let alone what that library can provide access to) to find relevant information while they are searching. This may be particularly important to the National Library of Medicine, as it arguably is attempting to serve anyone in the world who wants to find health information. This aspect of discovery can be labeled “content visibility.”

Content visibility includes harvesting by search engines, creating tools like RSS feeds and having permanent URLS. These different approaches provide opportunities for users to find library resources not only in their search results but also through their feed readers and blogs. The interview results demonstrated the varied thoughts on this particular topic, but Marshall Breeding summed up the feeling when he stated that “the goal shouldn’t be for library content to be found solely through search engines. We should be developing our interfaces so that once users come to us, through whatever means, they recognize our value and come directly to us and stay when they have information needs.” In other words, while being able to find library resources through non-traditional, non-library locations is vitally important as users are no longer necessarily starting in libraries (and as users become increasingly global), a good library interface will be able to demonstrate its utility and be easy enough to use that users, when faced with a similar information need a second time, will feel comfortable coming straight to the library interface instead of going to Google.

### Mobile interfaces

During the interviews, the idea of providing a mobile platform interface came up. As this was not a component of discovery interfaces that had previously been noted or discussed over the course of the project, it represented an area that should be explored more thoroughly. As more and more people, including health professionals, start using smartphones or even more standard cell phones to access the Internet, this area becomes more and more important. Providing a mobile interface could also potentially make it easier to reach users outside of NLM (i.e., those who are not in the Reading Room).

### On the horizon

Although the scope of this environmental scan was limited to looking at front end discovery interfaces, it became clear that there are a couple of new projects on the horizon that may impact the environment itself. The first is the eXtensible Catalog (XC) project, hosted at the University of Rochester and funded by a grant from the Andrew W. Mellon Foundation. According to its website (<http://www.extensiblecatalog.org/>, also captured in Appendix II), “The eXtensible Catalog (XC) Project is working to design and develop a set of open-source applications that will provide libraries with an alternative way to reveal their collections to library users.” This project is underway, and has recently released the first two software components: the OAI Toolkit and the NCIP Toolkit. It appears that XC will be a powerful tool that will make it easier to find solutions for the content visibility issue mentioned above, and that it will not be a replacement for the ILS.

The second project addresses more directly the issue of the entire ILS. The Open Library Environment (OLE), hopes “to produce a design document to inform open source library system development efforts, to guide future library system implementations, and to influence current Integrated Library System vendor product”, according to its website (<http://oleproject.org/>). The project notes several library partners, brought together at Duke University through another Andrew W. Mellon Foundation grant. Of note is the fact that Marshall Breeding is involved in this project, which posted its final report for the planning and design phase on July 26th, 2009. The plans for the next two years involve the actual system design and testing.

# Recommendations

In addition to the discussion above, the results from this project were used to develop recommendations in three main areas: recommended features, recommended interfaces, and recommended actions. Before moving into the specifics, however, it should be noted that there were limitations to this project. The first major limitation is that this scan was considered broad in scope, despite the focus on frontend interfaces only. Therefore, the literature review and website collection were focused more on finding a good range of material rather than finding everything on the topic. There is certainly a large amount of material that is not included here, and a systematic review of the literature may need to be undertaken in order to make true comparisons and uncover trends. The literature review was also limited to the two library literature databases that were accessible from NLM; a search in the ERIC and other databases may be useful to see if literature can be found on interfaces in other fields (museums, organizations, etc.). Additional search terms and strategies may also find more relevant resources. The second major limitation is the fact that the work done for this report did not explicitly include looking for information on users, beyond asking staff members who they considered NLM users to be. It is difficult to pinpoint NLM users and attempting to survey or otherwise work with them directly would require going through the proper channels for permission and documentation. The users are the most important players in implementing a new interface to NLM resources, so this limitation will need to be addressed.

### Features

These recommended features were chosen to help guide the evaluation of specific interfaces and to give NLM a list of possible priorities.

* **Advanced search**
  + Advanced search was mentioned in the interviews and the literature review, and was seen in numerous examples found on the web. Personal experience on the NLM reference desk also suggests that an advanced search is necessary for the types of search that Reading Room users often need. In addition, one of NLM’s more vocal user groups are medical librarians, who tend to prefer the more power advanced search options.
* **Facets**
  + Facets can be thought of as item attributes or dimensions, and any given item can have more than one, such as subject or time period. The CITE/ILS comparison study, although dated, found that NLM users most often search by subject. Facets help users apply limits as they look at search results, rather than before. They are commonly used on consumer website, where users are accustomed to seeing them. They were again mentioned during the interviews, were seen in nearly every example on the web, and were discussed in several articles, including Olson’s “Utility of a faceted catalog for scholarly research” [17].
* **Visuals**
  + Although book covers and other images may not be useful for NLM users trying to choose between scholarly materials, they can be helpful in an interface purely as visual cues and breaking up long lists. Visuals are common in discovery interfaces and throughout the web, and are something that users have become accustomed to.
* **“Did you mean”/spell check**
  + Pages with no results need to be a thing of the past. Spell checking was mentioned several times during the interviews, and is common (although not ubiquitous) in the latest discovery interfaces as well as major search engines and other websites that internet users are familiar with. It may even be possible to leverage NLM’s UMLS resource to do this.
* **Inclusion of multiple sources**
  + NLM has a number of unique collections that should all be found in one place. The results should be able to indicate which collection an item was in originally, and facets will help limit to only one collection when users need to do so. The literature (specifically Bowen “Metadata to Support Next-Generation Library Resource Discovery”) indicates that this capability is a goal for next generation discovery interfaces.
* **Relevancy****ranking**
  + This feature is one that NLM currently utilizes in its Voyager interface, and any replacement should continue to do so. It has become standard in most interfaces (only three of those looked at in the comparison were maybes – the rest incorporated the feature). Antelman discusses in detail NCSU’s use and tweaking of the ranking algorithm in her article [7]. It was also mentioned in all the external interviews and several of the internal.
* **Browse**
  + The need for a browse feature should be explored further. It was mentioned briefly by Antelman and Calhoun in the literature, and is on the “wishlist” for the Blacklight interface. The ability to simply scroll through everything around a given starting point (as was the case when the card catalog was used) is an important way that users discover information.
* **Incorporation of SFX/Umlaut link resolving** to take users to outside resources
  + The ability to bring users to outside resources from within a discovery interface could be a powerful asset. Access to everything possible is one of those features internet users have come to expect, and link resolving gives access to resources such as Hathi Trust, Google Books, etc. that could be extraordinarily helpful. This is perhaps especially so for users outside the Reading Room (although, additionally link resolving inside NLM also serves to take users to subscription content). NLM will be undertaking a project in the fall to harness open URL link resolving, so it may be imperative for a new discovery interface to incorporate this feature seamlessly.

There are two common and/or often discussed features that have been left off this list. The first is the “simple search” box, that users intuitively know how to use by entering keywords. This feature has become standard and was observed on every interface explored for this scan, so it was deemed unnecessary to include it as a feature to be evaluated. However, if this standard changes or a new interface is developed that uses some other entry point, then it should be revisited. The second feature is user-generated content. Although it was mentioned in the interview component of the scan, little to no information was found on its use or its ability to aid in discovery, especially in a research-type environment. This is not to say that an interface with tagging or user review capabilities would be detrimental, but simply that the inclusion/exclusion of this feature should not necessarily be part of an interface’s evaluation without further research into its benefits.

### Interfaces

Based on the results of the project, it was possible to make some recommendations regarding specific interfaces that may be suitable for NLM. The top recommendation is for NLM to go with an open-source product. The in-house skills exist here, and these solutions will give NLM the flexibility it needs to serve its users in such a unique setting. There are several options, but it was decided that Blacklight or VuFind provide the best options for NLM ([18], [12]). Preliminary impressions are that VuFind has strengths in its APIs and its advanced search feature, while Blacklight is specifically designed to include non-book records and has developed customizable interfaces for different user groups. Blacklight is also already designed to work with Fedora digital repositories (NLM is current implement its Fedora repository). Both are built on SOLR indexes (which is an open source enterprise search server with powerful relevancy ranking capabilities), have strong communities that support and improve the products and both incorporate numerous features, including most of the above recommended features. Most importantly, either of these products would serve NLM users very well, and would allow NLM to customize and to be involved in an open source project that may benefit many different groups and which would allow the possibility for outside developers to help NLM by creating imaginative solutions that are not dependent on proprietary software.

However, if it is determined that NLM would be better served by a proprietary service, the recommendation would be for Ex Libris’s Primo. Primo was chosen for several reasons. First, several products were eliminated from the outset (LS2 PAC, SirsiDynix’s Enterprise, etc.) because they appeared to be more suited for public libraries with more traditional collections. Second, Primo should also integrate seamlessly with Voyager, which is also an Ex Libris product, although Primo can also work on top of other ILSs, should NLM decide to switch backends in the future. It also scored the highest in the feature comparison and incorporated all of the main recommended features. It also addressed further considerations such as accessibility and having an open API. It needs to be noted that the Aquabrowser and Endeca platforms had similar features and strengths and should also be considered, but based on the implementations explored during this project, Primo seemed the best fit for NLM.

The following chart gives some additional information on these three interfaces (see also Appendix III for example screenshots).

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Examples** | **Provider** | **Features** |
| VUFind | National Library of Australia: <http://catalogue.nla.gov.au/>  University of Michigan: <http://mirlyn2-beta.lib.umich.edu/> | Open source-Villanova Univ.: http://www.vufind.org/ | * Advanced search – yes * Facets – yes * Visuals – yes * “Did you mean”/spell check – yes * Inclusion of multiple sources – yes * Browse – yes * Incorporation of [SFX/Umlaut link resolving](http://findit.library.jhu.edu/go/199742) to take users to outside resources – yes * Live status/availability (AJAX query of catalog) * Collections/lists * Author biographies * Various APIs to interact w/ data/search/etc. * Persistent URLs * User-generated content (tags, comments), * MARC view |
| Blacklight | University of Virgina (beta): <http://virgobeta.lib.virginia.edu/> | Open Source - UVa: http://blacklightopac.org/ | * Advanced search – no * Facets – yes * Visuals – yes * “Did you mean”/spell check – no * Inclusion of multiple sources – yes * Browse – facets * Incorporation of [SFX/Umlaut link resolving](http://findit.library.jhu.edu/go/199742) to take users to outside resources – ? * Custom interfaces for different populations |

|  |  |  |  |
| --- | --- | --- | --- |
| Primo | University of Minnesota: <http://www.lib.umn.edu/site/catalogs.phtml>  Vanderbilt: [http://discoverlibrary.vanderbilt.edu](http://discoverlibrary.vanderbilt.edu/) | ExLibris: <http://www.exlibrisgroup.com/category/PrimoOverview> | * Advanced search – yes * Facets – yes * Visuals – yes * “Did you mean”/spell check – yes * Inclusion of multiple sources – yes * Browse – no * Incorporation of [SFX/Umlaut link resolving](http://findit.library.jhu.edu/go/199742) to take users to outside resources – yes * Search through different repositories and information silos (including databases) * Item access information & get it feature * User content (tags, reviews) * Can view other editions/versions * Add to e-shelf |

### Actions

The final set of recommendations consists of actions that NLM may consider taking as it moves forward with implementing a new discovery interface.

* **Evaluation**
  + The first step is to evaluate who NLM users are and to determine what they want, to help with any decision making regarding the interface and its features. This includes making the decision to consciously reach out to users beyond the Reading Room (or not). As noted before, NLM users could potentially be anyone, but they are looking specifically for health-related information. This is different from most other libraries, who generally know who their users are and so have to think about what to provide for them. However, this step of evaluation will provide the benchmarks for continued evaluation of the service and is therefore vital. Surveys and focus groups may be good starting points.
  + For the second step, it should again be noted that numerous interface options are available – both from commercial vendors and community-supported open source projects. A cost-benefit analysis will be the key to making a decision to solidify which features are the most important. Cost in staff time as well as product up-front and maintenance fees should be included.
  + Finally, evaluation from the outset of any implementations will help drive improvement and see what is working and what is not. It will be helpful to have an evaluation plan in place even before implementing a pilot so that data can be gathered and analyzed beginning immediately and the improvement (or replacement) process can begin as soon as possible.
* **Staying informed**
  + Monitor the listservs and blogs as well as the literature. Discovery interfaces are constantly changing, and while the literature will be important in analysis, new features, products, and important news items will be communicated first through e-mail and blog entries. In addition, make sure relevant conferences have representatives who can report new findings back to the rest of the staff.
* **Becoming involved**
  + By becoming part of a community of libraries (including other large government libraries like the Library of Congress and the National Agricultural Library), NLM can influence the future of discovery interfaces as well as keep up to date on important issues. There are many ways of accomplishing this; for example, the National Agricultural Library recently sponsored a local code4lib meetup. It may also be possible work with open source communities (an opportunity may lie in providing a “crowd sourcing” opportunity for developers to create new applications with an NLM API during the 175th anniversary). Sharing experiences by publishing evaluation results is another example.
* **Utilizing technological skills**
  + Finally, NLM has a lot of talent it can leverage (from in-depth coding to those with eyes for good ideas). Allowing people to play with the possibilities, whether in an open-source system or by testing the capabilities of a proprietary interface, will create stronger systems and may also help recruit and retain more talent.

### Mock-up

A visual mock-up featuring items from these three areas of recommendations was the final product of this project. It was created as a way to demonstrate the potential of a new discovery interface, and was created by taking screenshots from the Hathi Trust Digital Library, the University of Australia, the University of Michigan, the University of Minnesota, North Carolina State University, and the University of North Carolina-Chapel Hill. These screenshots were manipulated in Photoshop, with the addition of images from HMD and a Creative Commons photograph found on Flickr by “NguyenDai” (<http://www.flickr.com/photos/nguyendai/404631197/>).

Although the mock-up is best viewed as part of the PowerPoint presentation for this project, the images have been captured in this report in Appendix VIII along with the following explanation:

Image 1: This would be the front page for the interface and would be the starting point for users who came to the directly to the catalog (for instance, through the NLM homepage, as opposed to those users who enter the interface at a specific resource from an outside source such as a search engine). Of note are the visual cues denoting the different collections, the advanced search option, the simple search box that will allow users to search across all the various collections of NLM materials, and the ability to limit to materials that available online only (for outside users unable to access NLM’s physical and subscription content).

Image 2: This image shows an example search results page. Again the visuals are apparent, as are the facets (where the user could theoretically limit by collection if s/he chose to do so) and the relevancy ranking. Additional items of potential interest are the RSS feed (for new results), browse capabilities, a way for users to collect items of interest (“e-shelf”), and availability, including online.

Image 3: A potential item record is seen in this image. There are numerous features shown here that are available above and beyond the features pulled out in this report, including a list of similar items and the ability to push out the citation to EndNote and Refworks. Of particular note on this page, however, is the incorporation of link resolving and other tools to take users to outside resources, including LibraryThing and the full text through Google Books.

Image 4: Although this image was not manipulated, it demonstrates how a user might chose to go to an outside source like Hathi Trust to determine if an item is valuable enough to access by actually going to the library. Here, a full text search is possible, without being about to view the full text.

Image 5: Should the user decide that an item is of value, there should be a way to capture it. In this case, incorporating the mobile capabilities mentioned in the discussion section, the user has decided to text the item’s information to him/herself in order to take that information elsewhere, either to NLM or a local library.

# Author Reflections

This project began for me as a title on a spreadsheet and a short proposal in an e-mail attachment. For nearly six months, it has been occupying my time and giving the spring project half of the NLM Associate Fellowship Program its meaning. I originally chose to work on the discovery interfaces environmental scan for a two reasons: first, the project leaders were people I wanted to work with, and second, I have had an informal, personal interest in catalogs and interfaces since training new student workers on III’s circulation module in my undergraduate years. This interest had led me to lurk on the NGC4LIB and code4lib listservs, and so I was peripherally aware of some of the exciting new developments. As the project progressed, however, I found more and more reasons to enjoy it. First of all, I have to give the generic reason: I learned an incredible amount. Not only about the specific systems that are out there, but what an “API” is, the amazing interfaces that non-libraries and library partnerships (the Brooklyn Museum and the World Digital Library) create, and even how to use Photoshop. Secondly, it gave me some direction at the conferences the Fellows were required to attend. It is perhaps a very tangential reason, but being thrown into meetings like Computers for Libraries and MLA fairly early in the spring was overwhelming, and it was extremely helpful to pick out sessions relevant to my project (where I heard some very excellent speakers, including Marshall Breeding). Finally, I was able to talk in depth with numerous NLM staff across the library with whom I probably would not have been able to otherwise. Not only do I feel that the experience helped me build upon my communication skills and my confidence in interview settings, but I made numerous contacts that I feel will continue to serve me well. The same holds true for my discussions with the three people outside of NLM. I was honored and thank every one of the people interviewed for taking the time to speak with me.

In closing, I would like to mention one of my goals that I wrote back in November, early on in the program: “To have a positive impact on an NLM workflow or to be part of something that will have an impact on NLM resource users.” In other words, I wanted to be a part of something that I could perhaps point to in a few years and state that I had had the opportunity to help back at its inception. It is perhaps a common goal of the AFP Fellows to leave some kind of legacy, but I hope that this work will serve its purpose and help the Collection, Preservation, and Access to Information strategic planning working group. I am very grateful to have had this opportunity.

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# Appendix I: Recommended Reading

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# Appendix II: Delicious.com

<http://delicious.com/donaamy>

Log-in info (if needed for additional link collection):

Go to <http://delicious.com>

**Username:** donaamy

**Password:** discovery09

Once logged in, the links can also be exported for import into a browser (such as FireFox favorites) or another Delious.com account.

Appendix III: Example Screenshots

# Appendix IV: Interfaces

# Appendix V: Interface Features Comparison

Appendix VI: NLM Interview Transcripts

## Compiled Interviews:

1. **How could a new NLM catalog discovery interface maximize its utility for the communities and users served by NLM? Please also describe the specific communities and users you are thinking of,**

***Interface appearance:***

* A “seamless” interface, consistent across collections (although with some differentiation, like logos or colors, to signify to the user where s/he is).
  + Same navigation across the board.
  + As things stand now, you have to read every different system’s help to figure out when to use which tags.
  + It’s confusing to staff, let alone the public.
  + Knowing what people are looking for: e.g. Wanda has noticed users searching for articles in LocatorPlus.
* Go mobile!  Right now, users have to come to the library.
* Remember Ranganathan’s rule: don’t waste the user’s time.
* Following the rule, bring everything together, don’t let resources like Profiles in Science sit in separate silos.
* So a simple search for everything, “Gateway, but better,” including MedlinePlus, would be great [could target multiple types of users by allowing searches across multiple silos]
* Need to answer: how can the library look like what everyone else is doing?
* Needs to be attractive (include pictures!)
* Needs to solve the problems of too many hits or too few hits for given searches
* If something’s available digitally (our repository, PMC, also Google Books, Hathi Trust), that availability should be exposed.  Make it obvious.

***Organization:***

* Lots of things can be done with the information in the MARC records, but make it interface user friendly.
* The National Library of Australia makes it easy to see what’s available by format easily, graphical interface, more proactive.
* Noted that Voyager does use relevancy ranking based on MARC, and 2 years ago they did tweak it using the information in the MARC fields.
* One thing that might “maximize utility:” facets.

***Users:***

* Users thinking about include outside librarians, just anyone who falls in/finds us through Google, as well as NLM’s own reference librarians and other staff.
* Users: originally librarians and medical researchers.  Now lots of groups, including the two original: historians outside of medicine (sociology, e.g.), students, consumers…The catalog should help everybody.
* We don’t have an exact handle on our users.  People probably don’t come to us except after a triage process (checking other places first), and then it’s to actually access the collection.  Librarians are probably big users.
* Reading room users versus outside users
* Suggested speaking with Steve Greenberg & Michael North, to get the HMD reference desk perspective as far as users go.
* Thinking about the general public:
* Supplied a list of users that was created for the access group working on the digital repository.

1. **What should be the scope of a new NLM discovery interface—that is, could it be a replacement of LocatorPlus and the NLM Catalog? Should it provide access to NLM’s bibliographic information as well as its digital objects/collections?**

***1-stop interface:***

* New interface could/should take the place of the current interfaces (L+, Gateway, NLM Catalog) (one stop may be best)
* We need 1 interface that’s complete with the features of LocatorPlus and NLM Catalog (+ more than we have now)
* It should probably be a replacement. You do get the “best of both worlds” in the two, though.
* OPAC should search all our **own** silos (not outside sources), and at the very least include Profiles in Science.
* The one replacement doesn’t necessarily have to be the main face of NLM, though.
* It should be as universal and encompassing as possible.  A catalog that could interface w/ the Entrez system.
* Should be able to limit to only digital, but be able to get to that digital information through the catalog (1 stop shop)

***What “silos” should be included:***

* At one point, they did try to combine numerous types of objects into the Voyager ILS, but groups of things later split off.
* Digital collections should also be included
* Would like to see the HMD image database also included.
* Bring in other legacy catalogs like IndexCat for both cataloging & access purposes
* Something that would fill all needs, including internal (see above; include M+).  Keep MARC display option for those who use that (librarians); it is a structured way to display data.  Reduce catalogs to 1.

***Access & Explanation:***

* Most important thing to users is availability and access, not “what” something is (book vs. journal vs. web resource)
* What’s available which way (NLM owns, freely available, on internet, etc.), customizable
* Specifically make it clear how to find A/V materials
* Gateway isn’t explanatory; something that searches through all our resources will need to be, and will need to indicate what resources are for which audiences and have example links/citations.

***Behind the results:***

* Utilize MeSH (as is done in the NLM catalog –explode)
* Bibliographic info/MARC should be in a separate tab
* Bibliographic piece: catalog should be authority. For example, the digital repository will have records also in the catalog.

1. **What, if any, are an online catalog’s unique benefits to information seekers, compared to other types of discovery systems?**

***Collection:***

* Unique material
* Inventory of what we, NLM, have
* Unique collection; there’s a lot of historical materials, and there’s going to be a lot more.
* A place to record the info (what’s being preserved) for posterity, show off our interesting stuff (e.g. Civil War Journal)

***Access:***

* Shows the availability
* The catalog serves as users’ means to find and access materials; outside users want to see if books exist.
* Agreed that holdings info and being able to check availability at a specific location is important (people don’t want to make the trip if something’s not there)
* Specifically, the catalog can answer the what (we have), where (to find it), and how (to get it). We have a lot of records that we don’t necessarily own, such as electronic resources, but we can take users to those items.

***Powerful metadata/information:***

* Currently giving access to the MARC view, sharing data with other libraries/librarians; structured way to search, that some people are used to using and do use, with controlled vocabulary.  It’s more powerful.
* OPACs offer curated information, selected set, chosen for a reason (that the items have some value)
* Authoritative

***Other thoughts:***

* Doesn’t really think there are any other systems that could replace the library catalog.
* Necessary for in-house users (catalogers and selectors, e.g.), for decision making.
* None!  The word “catalog” needs to go away.  Dashboard access w/ search bar like Bibliocommons is preferable.
* The catalog is therefore something that “you would always need.”

1. **What specific features would you like to see included in a new interface?**

***Spellchecking/did you mean:***

* Elimination of “no hits” screens; OPACs should always return some result, like Google’s “did you mean…”
  + Included possibly in here would then be spell checkers, but also keep in mind dangers of bringing up false hits that could confuse.
* More Google-like, with the correct results.  “Paul Berg” example; Google brings up the correct info even with misspellings; catalog subject search for paul berg isn’t even close because of the alphabetical indexing.
* Spell check/did you mean (make use of the UMLS!)
* Spell checker/”did you mean”

***Visuals:***

* Prettier! Not cluttered, but needs to be more attractive. Neither L+ nor Unicorn implementation are very pretty.
  + There hasn’t been much competition for library systems, so there hasn’t been pressure to improve in this area. But that may be changing with open source options.
* Friendlier interface, push stuff out a little beyond the blank box, like Australia w/ their pictures representing the different formats.
* Again, pictures.
* Book covers aren’t necessary at NLM; industry/public libraries tend to use covers more. ToCs and “look inside” content are more useful for people trying to determine if a particular item is wanted.

***Web 2.0:***

* User personalization: notes & sharing, so that users are doing work in “our space” (instead of taking things back to the services their home institutions provide)
* Web 2.0, including the Bibliocommons “my collection” feature (reviews, tags, send to delicious, twitter, etc.)
* Tag clouds, which are now kind of expected
* LibraryThing-like features: show events, incorporate forums.  Connect people and form a community.
* Let users create their own “collections,” and also push out generic collections “10 best books” (i.e., featured collections, basically proactive bibliographies)
* RSS
* Personalization: tagging, e-mailing links

***Integration with other sources:***

* Integrate clinical trials.
* Flash results, coming up as things are found right away [check out the engine that Relais is saying they’re going to use: pazpar2].  Separate boxes for the separate sources, but a federated search.
* Pull from knowledge sources as available: Google Books, things for serials [tables of contents, e.g.], WorldCat integration
* Ability to search inside and/or at least view table of contents
* Tables of contents, to aid discovery
* Point to outside sources, instead of bringing into the catalog (e.g. cover art)
* Leverage what others are doing (providers of this external content), and we do what we’re good at (selection)
* “Show me a page,” tables of contents
* Seamless links to digital resources, finding full text
* Find in other libraries
* Some things that we’re already looking at: SFX/link resolving and tables of contents.

***Facets:***

* Faceted search/drill-down searching, which aid discovery by showing links between items
* Faceted searching, exploiting the MARC data
* Facets/clustering.

***Others:***

* User-friendly, explanatory tabs that reduce guessing. Wanda has seen people interpreting the current tabs differently (in LocatorPlus)
* More webservices, like Z39.50; more modern ways to pull out large sets of records.
* But keep advanced search for known-item and expert searches
* Digitize items in the public domain, and incorporate a “print a book” on-demand publishing option for those materials.
* Make it a better experience
* More intuitive limits
* All part of one interface.
* A deeper look at what parts of the cataloging record are actually useful
* Leverage Vivisimo for better search
* Mobile platform interface
* Offering the interface in other languages (e.g. Spanish), which is possible with LocatorPlus.

1. **Should NLM “push” its content out to users? If so, where and how?**

***Outside indexes:***

* Having our bibliographic content indexed by Google would be good.
* Other places include other search engines, but Google is the big one.
* Yes.  To WorldCat.  Google should be indexing us.  Google Scholar (through SFX), although users would have to be onsite.  OAIster, sending out our repository records for others to harvest (other OAIHs, too)
* Tie to Hathi Trust (maybe through WorldCat, since that’s going to be the official catalog)
* Harvestable by Google.
* As far as search engines go, we should allow harvesting rather than worrying about “pushing” our content out. Let Google crawl our space, but don’t worry about it.

***Target audiences:***

* To clinicaltrials.gov patients/participants
* To research grantees
* Provide weekly feeds to these specific audiences, for example
* Send out info on what we’ve collected, using the featured collections mentioned above, RSS feeds, other subscription-type services
* It depends. If we saw a need, like user requests, then yes.
* New book list.

1. **Can you name some implementations of nextgen discovery interfaces that you’ve liked?**

***Systems:***

* Libraries using Joomla (and other CMSs) in interesting ways
* Has seen/heard about the LibraryThing implementations
* Koha system provides a clean interface
* Likes EOS system (demonstration at CIL)
* InMagic’s “social OPAC,” which includes other types of content like reviews that are brought into the record. There’s also a feedback/suggestions mechanism that she likes integrated into the system.
* Primo & Encore are fine, so is Aquabrowser, but none of them do the searches described above.  (Primo’s tab system allows a user to search everything or just catalog).  But they’re good starts.
* Blacklight, which is working on interfacing w/ Fedora
* Bibliocommons; LibraryThing; Primo
* Faceted catalogs (Endeca) seem better than the Aquabrowser’s wordcloud approach.
* WorldCat - searchability from Google; not having to know to go to WorldCat directly.
* Endeca’s nice, but the library platform should act more like Amazon.
* Blacklight

***Specific Libraries:***

* Umlaut implementation at Johns Hopkins
* Australia
  + World Digital Library, doing neat things with the map.
  + The various Australian/New Zealand examples
  + NCSU, which has the facets. The look has stayed the same for the past 3 years or so, which is indicative of the system working for the institution.

***Other:***

* Canon’s website (electronics/photocopiers/cameras), which has great visuals, broad categories that narrow down, and brief summaries.
* Other good interface examples: iGoogle, Netvibes: the way they display multiple RSS feeds are possibly models for how concurrent searching might be displayed on the screen, with multiple boxes each doing their own process,etc.”

## 5/7/2009: Interview w/ Wanda Whitney, Librarian, RWS

1. **How could a new NLM catalog discovery interface maximize its utility for the communities and users served by NLM? Please also describe the specific communities and users you are thinking of.**

* A “seamless” interface, consistent across collections (although with some differentiation, like logos or colors, to signify to the user where s/he is).
  + Same navigation across the board.
  + As things stand now, you have to read every different system’s help to figure out when to use which tags.
  + It’s confusing to staff, let alone the public.
  + Knowing what people are looking for: e.g. Wanda has noticed users searching for articles in LocatorPlus.
* Users thinking about include outside librarians, just anyone who falls in/finds us through Google, as well as NLM’s own reference librarians and other staff.

1. **What should be the scope of a new NLM discovery interface—that is, could it be a replacement of LocatorPlus and the NLM Catalog? Should it provide access to NLM’s bibliographic information as well as its digital objects/collections?**

* New interface could/should take the place of the current interfaces (L+, Gateway, NLM Catalog) (one stop may be best)
* Digital collections should also be included
* Would like to see the HMD image database also included.

1. **What, if any, are an online catalog’s unique benefits to information seekers, compared to other types of discovery systems?**

* Necessary for in-house users (catalogers and selectors, e.g.), for decision making.
* Unique material
* Doesn’t really think there are any other systems that could replace the library catalog.
* Agreed that holdings info and being able to check availability at a specific location is important (people don’t want to make the trip if something’s not there)

1. **What specific features would you like to see included in a new interface?**

* Elimination of “no hits” screens; OPACs should always return some result, like Google’s “did you mean…”
  + Wanda has also worked with Sirsi’s Unicorn system through Montgomery County libraries: “It does not spell check, unfortunately. It just returns no hits. What we do is go to Amazon and run a search on a title, author, etc. if we feel that there's any chance that a spelling issue is the reason we aren't getting hits in Sirsi.”
  + Included possibly in here would then be spell checkers, but also keep in mind dangers of bringing up false hits that could confuse.
* Prettier! Not cluttered, but needs to be more attractive. Neither L+ nor Unicorn implementation are very pretty.
  + There hasn’t been much competition for library systems, so there hasn’t been pressure to improve in this area. But that may be changing with open source options.
* User-friendly, explanatory tabs that reduce guessing. Wanda has seen people interpreting the current tabs differently (in LocatorPlus)

1. **Should NLM “push” its content out to users? If so, where and how?**

* Having our bibliographic content indexed by Google would be good.
* Other places include other search engines, but Google is the big one.

1. **Can you name some implementations of nextgen discovery interfaces that you’ve liked?**

* Libraries using Joomla (and other CMSs) in interesting ways
* Has seen/heard about the LibraryThing implementations
* Koha system provides a clean interface
* Likes EOS system (demonstration at CIL), will get back to me on specifics
* InMagic’s “social OPAC,” which includes other types of content like reviews that are brought into the record.
  + There’s also a feedback/suggestions mechanism that she likes integrated into the system.

## 5/26/2009: Interview w/ Dee Clarkin, Head; Onsite Unit, CAS

1. **How could a new NLM catalog discovery interface maximize its utility for the communities and users served by NLM? Please also describe the specific communities and users you are thinking of.**

* Thinking about the general public:
* Go mobile!  Right now, users have to come to the library.
* Remember Ranganathan’s rule: don’t waste the user’s time.
* Following the rule, bring everything together, don’t let resources like Profiles in Science sit in separate silos.

1. **What should be the scope of a new NLM discovery interface—that is, could it be a replacement of LocatorPlus and the NLM Catalog? Should it provide access to NLM’s bibliographic information as well as its digital objects/collections?**

* Bibliographic info/MARC should be in a separate tab
* Most important thing to users is availability and access, not “what” something is (book vs. journal vs. web resource)

1. **What, if any, are an online catalog’s unique benefits to information seekers, compared to other types of discovery systems?**

* None!  The word “catalog” needs to go away.  Dashboard access w/ search bar like Bibliocommons is preferable.

1. **What specific features would you like to see included in a new interface?**

* More Google-like, with the correct results.  “Paul Berg” example; Google brings up the correct info even with misspellings; catalog subject search for paul berg isn’t even close because of the alphabetical indexing.
* Faceted search/drill-down searching, which aid discovery by showing links between items
* But keep advanced search for known-item and expert searches
* Web 2.0, including the Bibliocommons “my collection” feature (reviews, tags, send to delicious, twitter, etc.)
* Ability to search inside and/or at least view table of contents
* Spell check/did you mean (make use of the UMLS!)
* LibraryThing-like features: show events, incorporate forums.  Connect people and form a community.  Integrate clinical trials.
* Digitize items in the public domain, and incorporate a “print a book” on-demand publishing option for those materials.

1. **Should NLM “push” its content out to users? If so, where and how?**

* To clinicaltrials.gov patients/participants
* To research grantees
* Provide weekly feeds to these specific audiences, for example

1. **Can you name some implementations of nextgen discovery interfaces that you’ve liked?**

* Bibliocommons; LibraryThing; Canon’s website (electronics/photocopiers/cameras), which has great visuals, broad categories that narrow down, and brief summaries; Primo

\*Be careful of making things “magical” to the user.  The goal is ease of use, not alienation.

## 5/28/2009: Interview w/ John Doyle, Senior Technical Information Specialist, TSD

1. **How could a new NLM catalog/discovery interface maximize its utility for the communities and users served by NLM? Please also describe the specific communities and users you are thinking about.**

* We don’t have an exact handle on our users.  People probably don’t come to us except after a triage process (checking other places first), and then it’s to actually access the collection.  Librarians are probably big users.
* So a simple search for everything, “Gateway, but better,” including MedlinePlus, would be great [could target multiple types of users by allowing searches across multiple silos]

1. **What should be the scope of a new NLM discovery interface—that is, could it be a replacement for LocatorPlus and the NLM Catalog? Should it provide access to NLM’s bibliographic information as well as its digital objects?**

* Something that would fill all needs, including internal (see above; include M+).  Keep MARC display option for those who use that (librarians); it is a structured way to display data.  Reduce catalogs to 1.

1. **What, if any, are an online catalog’s unique benefits to information seekers, compared to other types of discovery systems?**

* Currently giving access to the MARC view, sharing data with other libraries/librarians; structured way to search, that some people are used to using and do use, with controlled vocabulary.  It’s more powerful.

1. **What specific features would you like to see included in a new interface?**

* Flash results, coming up as things are found right away [check out the engine that Relais is saying they’re going to use: pazpar2].  Separate boxes for the separate sources, but a federated search.
* More webservices, like Z39.50; more modern ways to pull out large sets of records.
* User personalization: notes & sharing, so that users are doing work in “our space” (instead of taking things back to the services their home institutions provide)
* Tag clouds, which are now kind of expected
* Pull from knowledge sources as available: Google Books, things for serials [tables of contents, e.g.], WorldCat integration

1. **Should NLM “push” its content out to users? If so, where and how?**

* Yes.  To WorldCat.  Google should be indexing us.  Google Scholar (through SFX), although users would have to be onsite.  OAIster, sending out our repository records for others to harvest (other OAIHs, too)
* Tie to Hathi Trust (maybe through WorldCat, since that’s going to be the official catalog)

1. **Can you name some implementations of nextgen discovery interfaces that you’ve liked?**

* Primo & Encore are fine, so is Aquabrowser, but none of them do the searches described above.  (Primo’s tab system allows a user to search everything or just catalog).  But they’re good starts.
* Blacklight, which is working on interfacing w/ Fedora
* Other good interface examples: iGoogle, Netvibes (which might provide a template for separated, concurrent searching w/ expansion of any one set of objects to full screen in the way the widgets work)
  + “I would just like to clarify that under no. 6, iGoogle and Netvibes don’t do the concurrent searching that I was describing, but the way they display multiple RSS feeds are possibly models for how that kind of search might be displayed on the screen, with multiple boxes each doing their own process,etc.”

Final thought: \*Traditional services (requests, ILL) should be readily visible in the interface, not pushing user back into Voyager.

## 6/2/2009: Interview w/ Dianne McCutcheon, Chief, TSD

1. **How could a new NLM catalog discovery interface maximize its utility for the communities and users served by NLM?  Please also describe the specific communities and users you are thinking about.**

* Users: originally librarians and medical researchers.  Now lots of groups, including the two original: historians outside of medicine (sociology, e.g.), students, consumers…The catalog should help everybody.
* If something’s available digitally (our repository, PMC, also Google Books, Hathi Trust), that availability should be exposed.  Make it obvious.
* The National Library of Australia makes it easy to see what’s available by format easily, graphical interface, more proactive.
* Lots of things can be done with the information in the MARC records, but make it interface user friendly.

1. **What should be the scope of a new NLM discovery interface – that is, could it be a replacement for LocatorPlus and the NLM Catalog?  Should it provide access to NLM’s bibliographic information as well as its digital objects (i.e. digital collections)?**

* It should be as universal and encompassing as possible.  A catalog that could interface w/ the Entrez system.
* Utilize MeSH (as is done in the NLM catalog –explode)
* We need 1 interface that’s complete with the features of LocatorPlus and NLM Catalog (+ more than we have now)
* Should be able to limit to only digital, but be able to get to that digital information through the catalog (1 stop shop)
* Bring in other legacy catalogs like IndexCat for both cataloging & access purposes
* What’s available which way (NLM owns, freely available, on internet, etc.), customizable

1. **What, if any, are an online catalog’s unique benefits to information seekers, compared to other types of discovery systems?**

* OPACs offer curated information, selected set, chosen for a reason (that the items have some value)
* Shows the availability
* Inventory of what we, NLM, have
* A place to record the info (what’s being preserved) for posterity, show off our interesting stuff (e.g. Civil War Journal)
* Authoritative

1. **What specific features would you like to see included in a new interface?**

* Tables of contents, to aid discovery
* Point to outside sources, instead of bringing into the catalog (e.g. cover art)
* Make it a better experience
* Leverage what others are doing (providers of this external content), and we do what we’re good at (selection)
* Seamless links to digital resources, finding full text
* Find in other libraries
* Faceted searching, exploiting the MARC data
* Friendlier interface, push stuff out a little beyond the blank box, like Australia w/ their pictures representing the different formats.
* More intuitive limits
* Let users create their own “collections,” and also push out generic collections “10 best books” (i.e., featured collections, basically proactive bibliographies)
* All part of one interface.

1. **Should NLM “push” its content out to users?  If so, where and how?**

* Send out info on what we’ve collected, using the featured collections mentioned above, RSS feeds, other subscription-type services
* Harvestable by Google.

1. **Can you name some implementations on nextgen discovery interfaces you’ve liked?**

* Faceted catalogs (Endeca) seem better than the Aquabrowser’s wordcloud approach.
* Umlaut implementation at Johns Hopkins
* Australia

Other note: strategic planning group is looking at these questions a little, too: what’s included in the catalog?  What records are worth having in the catalog?  Why just point to things if NLM doesn’t own?  Make actual cataloging easier by using records from outside sources for materials NLM does not own.

## 6/10/2009: Interview w/ Joyce Backus, Deputy Chief, PSD & Martha Fishel, Chief, PSD

1. **How could a new NLM catalog/discovery interface maximize its utility for the communities and users served by NLM? Please also describe the specific communities and users you are thinking about.**

* Reading room users versus outside users
* Need to answer: how can the library look like what everyone else is doing?
* Needs to be attractive (include pictures!)
* Needs to solve the problems of too many hits or too few hits for given searches

1. **What should be the scope of a new NLM discovery interface—that is, could it be a replacement for LocatorPlus and the NLM Catalog? Should it provide access to NLM’s bibliographic information as well as its digital objects?**

* OPAC should search all our **own** silos (not outside sources), and at the very least include Profiles in Science.
* Specifically make it clear how to find A/V materials
* Gateway isn’t explanatory; something that searches through all our resources will need to be, and will need to indicate what resources are for which audiences and have example links/citations.

1. **What, if any, are an online catalog’s unique benefits to information seekers, compared to other types of discovery systems?**

* The catalog serves as users’ means to find and access materials; outside users want to see if books exist.
* Unique collection; there’s a lot of historical materials, and there’s going to be a lot more.

1. **What specific features would you like to see included in a new interface?**

* Again, pictures.
* A deeper look at what parts of the cataloging record are actually useful
* “Show me a page,” tables of contents
* Leverage Vivisimo for better search

1. **Should NLM “push” its content out to users? If so, where and how?**

* ---

1. **Can you name some implementations of nextgen discovery interfaces that you’ve liked?**

* WorldCat - searchability from Google; not having to know to go to WorldCat directly.
* Endeca’s nice, but the library platform should act more like Amazon.

Other notes:

* Idea of different types of searches or tabs for different users is intriguing, but a decision needs to be made to determine what users we’re serving. (outside/inside, researchers/consumers?)
* David Lipman has idea/something in the pipeline to id type of user by how they’re searching behind the scene.
* Look at external/internal user stats.
* User/usability study will be necessary!

## 6/25/2009: Interview w/ Laurie Duquette, Systems Librarian, HMD

1. **How could a new NLM discovery interface maximize its utility for the communities and users served by NLM? Please also describe the specific communities and users you are thinking about.**
   * Suggested speaking with Steve Greenberg & Michael North, to get the HMD reference desk perspective as far as users go.
   * Supplied a list of users that was created for the access group working on the digital repository.
   * Noted that Voyager does use relevancy ranking based on MARC, and 2 years ago they did tweak it using the information in the MARC fields.
   * One thing that might “maximize utility:” facets.
2. **What should be the scope of a new NLM discovery interface—that is, could it be a replacement for LocatorPlus and the NLM Catalog? Should it provide access to NLM’s bibliographic information as well as its digital objects (i.e. digital collections)?**
   * It should probably be a replacement. You do get the “best of both worlds” in the two, though.
   * The one replacement doesn’t necessarily have to be the main face of NLM, though.
   * At one point, they did try to combine numerous types of objects into the Voyager ILS, but groups of things later split off.
   * Bibliographic piece: catalog should be authority. For example, the digital repository will have records also in the catalog.
3. **What, if any, are an online catalog’s unique benefits to information seekers, compared to other types of discovery systems?**
   * Specifically, the catalog can answer the what (we have), where (to find it), and how (to get it). We have a lot of records that we don’t necessarily own, such as electronic resources, but we can take to those items.
   * The catalog is therefore something that “you would always need.”
4. **What specific features would you like to see included in a new interface?**
   * Facets/clustering.
   * RSS
   * Spell checker/”did you mean”
   * Some things that we’re already looking at: SFX/link resolving and tables of contents.
   * Personalization: tagging, e-mailing links
   * Mobile platform interface
   * Book covers aren’t necessary at NLM; industry/public libraries tend to use covers more. ToCs and “look inside” content are more useful for people trying to determine if a particular item is wanted.
   * Offering the interface in other languages (e.g. Spanish), which is possible with LocatorPlus.
5. **Should NLM “push” its content out to users? If so, where and how?**
   * It depends. If we saw a need, like user requests, then yes.
   * New book list.
   * As far as search engines go, we should allow harvesting rather than worrying about “pushing” our content out. Let Google crawl our space, but don’t worry about it.
6. **Can you name some implementations of nextgen discovery interfaces that you’ve liked?**
   * World Digital Library, doing neat things with the map.
   * The various Australian/New Zealand examples
   * Blacklight
   * NCSU, which has the facets. The look has stayed the same for the past 3 years or so, which is indicative of the system working for the institution.

(\*During the LocatorPlus redesign, the team looked at features they liked and created a list that Laurie will send along.)

# Appendix VII: External Interview Transcripts

## 5/31/2009: Interview w/ Kristin Antelman, Associate Director for the Digital Library Administration, North Carolina State University (via e-mail)

“Amy,

Sure, I'd be happy to answer these questions. My overall thinking on this topic now is that local catalogs are not the way to go anymore, regardless of how "enhanced" they are. (It's possible NLM would be an exception here, because of the nature of its collection and clientele, so my thinking on this applies to research libraries generally.) WorldCat Local has progressed to the point that it is an excellent tool and one that operates at the "network level," while preferencing the local. Our Endeca catalog doesn't do that, although we have built it out to encompass the Triangle Research Libraries' collections, which, in a sense, attempts to appoach the network level.

1. **How do next or new generation interfaces maximize their utility for users?**

#1 is relevancy ranking, and giving the library control over how that works. Relevancy is very tricky with MARC records (e.g., random monographs published by the New York Times will rank higher than the newspaper, for example, because of the number of times "New York Times" appears in the record). #2 are the facets, which can be useful to narrow search results, particularly by location and format. #3 would be the control the library has over the look and feel of the interface; much more customization and a "modern" look is possible with these tools, in comparison with the very limited customizability of legacy OPACs.

1. **What can be found through your institution’s discovery interface? Why were those types of objects chosen?**

Standard catalog items are found through our interface (books, journals, videos, archival collections). We are currently adding finding aids, to enrich discoverability of our archival collections in the Triangle. My opinion is that it doesn't make sense to add digitized objects that are freely available to a given library's catalog, since users want to discover those at the network level, i.e., to find all objects related to that topic rather than just the ones your library has. Plus, there is no way in which the catalog represents everything a library "has" (a staff-centric concept anyway), because of the absence of article-level information.

1. **What benefits are there in the discovery interface for information seekers as opposed to the old system/OPAC?**

See #1.

1. **What features are the most popular/helpful? What’s missing?**

This is a good question. I'm not sure we really know, since we haven't had the resources to do the usability testing required to answer this.

We have feedback that users like cover art and enhanced content (TOCs, summaries). They also like "browse the shelf," a cal number-based browsing feature available in our old catalog that we're currently recreating in the Endeca environment. That concept has limited usefulness, however, since it doesn't encompass TRLN-wide collection, much less a broader range of materials available (GoogleBooks, etc.).

1. **Does your institution push its interface/content out on the web? If so, where and how?**

NCSU's and TRLN's catalogs are freely available on the web, of course.

We do not push out individual records (which doesn't make a lot of sense, since most people "discovering" that would not be NCSU affiliates and would be confused/frustrated finding those records, and Worldcat.org is serving this function). We are aggressively working on making sure our other open content (images, IR content) is discoverable, and with context, on the open web.

I hope this helps. Good luck with your project, and say hi to Jennifer for me. -Kristin”

## 6/24/2009: Interview w/ Bess Sadler, Chief Architect for the Online Library Environment, University of Virginia

1. **What can be found through your institution’s discovery interface? Why were those types of objects chosen?**

Everything in the ILS (books, journals, etc.), the digital repository, objects from the art museum, and in the future, anything that the library decides it wants its users to find. For example, “hidden collections,” such as reel-to-reel tapes and video footage of faculty talks could be included. Also looking at someday adding individual journal articles for all journal holdings.

1. **How do next generation interfaces maximize their utility for users (based on Karen Calhoun’s question in her interviews for a Library of Congress report)? (I.e., what about these interfaces makes them useful?)**

For undergrad users, relevancy ranking is key. The ability of Blacklight to **respond** to changing needs is key; it’s not cost effective for traditional ILS environments and is not done. The UVa implementation can cater directly to user populations such as music researchers (see the beta), again **responding** to a need (indexing instruments, which is a limiting facet in the implementation).

Historians are another user group that’s benefitting: they didn’t know they wanted to access to certain collections/items before because they didn’t know they existed in separate places. One place to search has increased visibility and allowing them to find information.

1. **What benefits are there for in the new interface as opposed to the old?**

Relevancy ranking is a huge benefit. The Solr search engine provides the foundation, but the algorithm can (and should) be customized for different institutions based on use cases. Faceted browsing is another benefit, as is an overall improved user interface.

1. **What features are the most popular/helpful? What’s missing?**

Relevancy ranking is the most popular, except amongst some librarians who were used to elaborate search strategies and have had to be retrained to try simple keyword searches first. The ability to add other types of objects, like EAD guides (which is being done at the Northwest Digital Archive implementation).

Things that are currently missing, but are on the roadmap: integration with various citation managers, other languages, browse/call number browse (Stanford programmer working on this feature).

1. **Does your institution push its content out on the web? If so, where and how?**

Everything in Blacklight can be indexed by Google because of the use of permanent URLs. Searches have permanent, meaningful URLs, too. This means that the items/searches can also be bookmarked and used for things as simple as linking to something from a blog post. Each item also has a unique identifier number that can be built upon: for example, <http://virgobeta.lib.virginia.edu/catalog/u4878534> can be manipulated as <http://virgobeta.lib.virginia.edu/catalog/u4878534.xml> and other extensions (the associated images, availability, etc., all have their own permanent URL). Others can build applications using the Blacklight data this way, and an iPhone mobile app has already been developed, creating a mobile version of the catalog without changing the entire website structure. RSS feeds are also available.

\*Additional thoughts, in response to my comment on the great strength of the Blacklight community:

Blacklight does have a strong support community, as does the Villanova-supported VUFind. VUFind is specifically better suited for smaller libraries and is more for books; everything in a VUFind system is treated as a book. VUFind also had only one main programmer, and since his departure, people have been waiting to see what happens next. Blacklight has taken a decentralized programming approach, with numerous organizations and developers helping out, including those at Johns Hopkins and Stanford. Blacklight is also better suited for taking different types of objects and metadata forms and integrating them in one interface.

## 6/25/2009: Interview w/ Marshall Breeding, Director for Innovative Technologies and Research, Vanderbilt University

1. **How do next or new generation interfaces maximize their utility for users?**
   * Terminology is actually a bit of an issue: Marshall suggests “discovery interfaces,” a phrase which describes the need and what these interfaces are designed to do.
   * Older interfaces don’t really allow non-expert users to discover things the way the web does. The web has evolved and OPACs haven’t, and there’s a disconnect.
   * They should present high quality information in a way that users understand and are used to without requiring instruction.
   * Key features are relevancy, facets, and visual appeal.
   * In general, their utility is better discovery.
2. **What can be found through your institution’s discovery interface? Why were those types of objects chosen?**
   * This is a key difference between the old and new interfaces: old are generally limited to what’s in the ILS, but new can often go beyond and span different components.
   * What’s inside the library?
   * At Vanderbilt, the Primo interface includes the ILS contents, the Television News Archive, the Global Music collection, the institutional repository, government documents collection, etc.
   * Those objects were chosen to be made more discoverable and were so included in the Primo index.
   * But as the interface changes to help users, as in the case of adding more types of objects, librarians often end up disliking it because it doesn’t work in a predictable fashion anymore.
   * But the alternative, having specialized interfaces for each group, means many different points of entry. Users expect to find things (the example is the number of users who search catalogs looking for articles) in one place. Librarians will need to adapt.
   * Related to including articles, the Vanderbilt Primo has a meta/federated search tab for searching across databases within the interface. However, Marshall suggests that federated search is not the best way to do things; one has to pick a small enough target for the different silos to deliver results.
   * The next threshold, which people are already moving towards with tools such as Summon, will be a single huge index that includes not only book & journal titles, but also articles and digital items (at individual rather than collection level). “web-scale indexing” at a granular level.
   * The problem will be relevancy and how to keep books (with MARC records) from getting buried by the articles (that have the full text indexed). Exposure.
   * There isn’t huge buy-in to the large index yet, and the original mindset is going to persist, but the bar is raising and discovery is now already beyond what has only just become standard (like “did you mean”) into these huge single indexes.
   * This is especially relevant to NLM, where we have huge amounts of data and access to the full text.
   * The next step may be to include the full text of books in searches, as Google, Amazon, Hathi Trust have done. Google should not have a monopoly; libraries need to be a part of this.
3. **What benefits are there in the library discovery interface for information seekers as opposed to other discovery interfaces?**
   * Library interfaces still need to catch up to Google and the already existing huge indexes. It’s hard to compete; these entities have more money and more programmers/technology support.
   * But libraries do have the information organization expertise, if we can get our act together.
   * Metadata, together with the full text, is key. Librarians are the creators and managers of high quality metadata, as well as ontologies, etc., that make our interfaces stronger.
   * Google, etc. are motivated by profit and are creating search algorithms and tools that attract the most “eyeballs” to generate revenue. Libraries’ motivations are different: to create tools that help users find the best information.
4. **What features are the most popular/helpful? What’s missing?**
   * Users at Vanderbilt do like the new interface (relevancy, attractiveness).
   * However, Vanderbilt still pushes out the old interface along with the new; should maybe just focus on the one.
5. **Does your institution push its interface/content out on the web? If so, where and how?**
   * This is a particular interest of Marshall’s.
   * We do need to leverage the fact that people do go to Google.
   * Marshall at Vanderbilt does work hard to get his collections indexed (Television News Archive), optimizing them with permanent URLs, site maps, etc.
   * 95% of the TV News Archive content is indexed, and he has noticed increased use.
   * Google is the primary benchmark, but he isn’t focused on optimizing for one search engine. Bing use is moving up.
   * But the goal shouldn’t be for library content to be found solely through search engines. We should be developing our interfaces so that once users come to us, through whatever means, they recognize our value and come directly to us and stay when they have information needs.

# Appendix VIII: Mock-up



Image 1

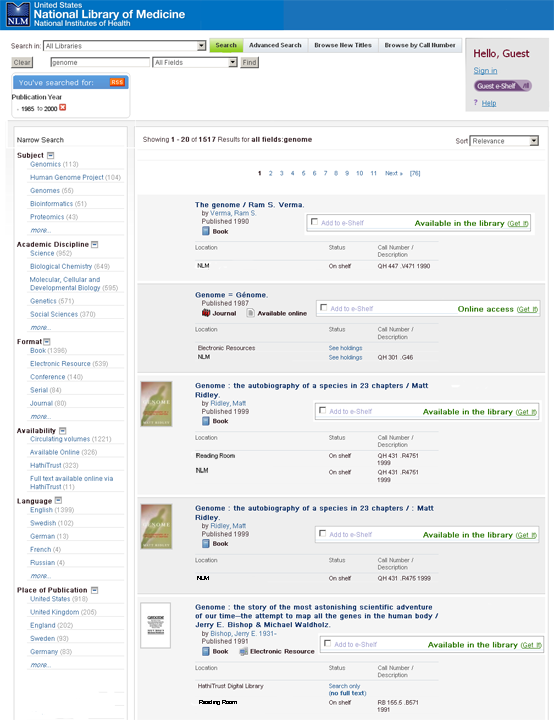


Image 2

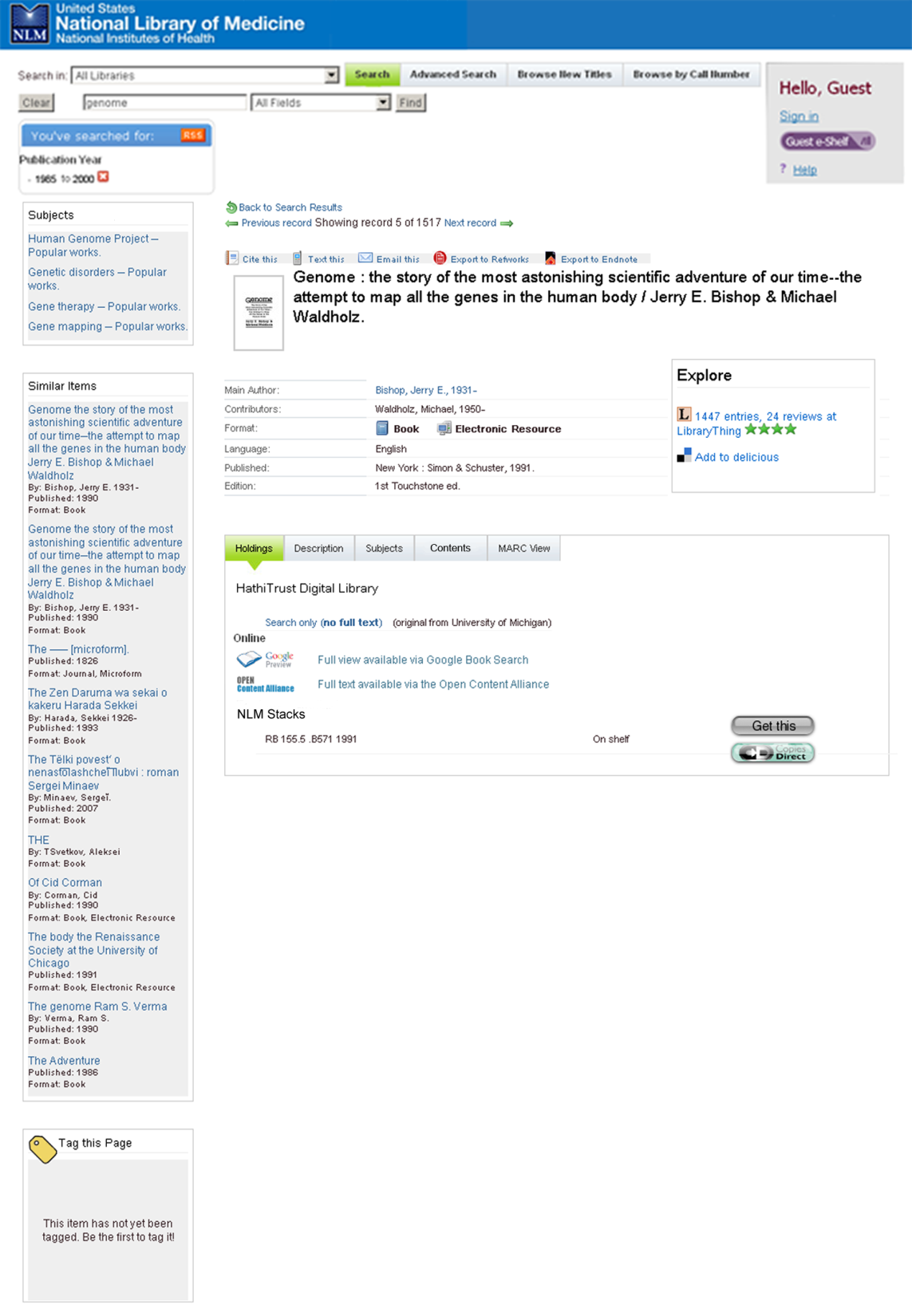


Image 3



Image 4

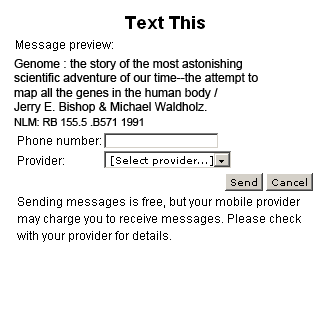


Image 5

# Appendix IX: Collected Resources & Handouts

| Meetings with Jennifer Marill & Debra Thangarajah | Handwritten notes, including the original project proposal, from meetings with project leaders. |
| --- | --- |
| ChiliFresh.com | Printout from http://www.chilifresh.com |
| Koha/PTFS | Vendor Handouts: Koha Implementation & Support, Koha Open Source ILS & ArchivalWare FAQ’s |
| Serial Solutions | Vendor Handouts: Aquabrowser & Summon |
| Virtua | Vendor Handouts: White Paper on FRBR, FRBR press release, Visualizer pamphlet, Virtua pamphlet |
| Computers in Libraries Conference ‘09 | Collected presentations, with notes |
| NISO Webinar: Data movement & Management | Handwritten notes, including some on Jennifer Bowen’s eXtensible Catalog presentation |
| NLM documents | Photocopies from Sally Sinn on closing of NLM’s card catalog |
| Interviews | Original handwritten notes (excluding Kristin Antelman; her interview is included in full in Appendix VI) |
| NLM Wiki: User Personas | Identified user groups for the Confluence – Cholera project, from Laurie Duquette |
| Draft: Library Operations Strategic Plan on Collection, Preservation and Access to Information | Goal 5: Reinvent the user experience by enhancing access to the NLM collection (plan that informed this project), from Joyce Backus & Martha Fishel |
| Screenshots and related blog entry | LibraryThing, Bibliocommons, Montgomery County Public Libraries, LocatorPlus, Google, David Lee King blog “Next Generation Library Interfaces,” from Dee Clarkin |