Expansion of Web-Based Library Services in Large Research Libraries:  
A Penn State Case Study

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ABSTRACT

To meet the changing needs and expectations of our users, the Penn State University Libraries is building a suite of Web-based services, including synchronous and asynchronous reference, by working with vendors to support services across system platforms. In building a robust and flexible system for managing digital reference services, the Libraries is using technology to improve the efficiency and effectiveness of these services, while providing a ubiquitous, point-of-need service to library users. The project was initiated after analysis of existing systems identified an unmet need for Web-based services. The project incorporates several methodologies to assess outcomes, user satisfaction, and performance.

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INTRODUCTION

Libraries are amassing a critical body of evidence about changing patterns in library use. To cite but a few examples, annual data from the Association of Research Libraries shows a continuing trend of declining reference questions across those institutions. While aggregate data is not yet available, many of these institutions are experiencing increased remote use of library resources. At the same time, we are also learning more about our users’ expectations, preferences, and their levels of satisfaction with library services. Data from national surveys such as LibQUAL+™, the Outsell survey, and the surveys of high school and college students conducted by the Pew Internet & American Life Project, have shown consistent broad trends indicating that library users expect increasing Web access to full text resources, that they prefer to use library resources from their home or office and to work independently, and that their satisfaction with library services depends, in part, on the library’s ability to accommodate those expectations and preferences. In response to these changes, the Penn State University Libraries is pursuing an expansion of Web-based library services, particularly synchronous and asynchronous reference or help desk services, to support our users’ needs for tools to both facilitate their independent use of library resources and to provide point-of-need assistance when it is needed. In this process we have identified two goals that have guided the development process: to build a comprehensive Web-based reference system across our twenty-four campuses and approximately fifty service points, and to engage users in designing new services based on an assessment and analysis of their needs.

BACKGROUND

This expansion of Web-based services has evolved in the complex environment of a large land-grant, Doctoral/Research – Extensive institution and our success has been dependent upon acknowledging two defining factors:

- **These services must be flexible and scalable to support the needs of a large, diverse user population.** Our primary user population includes approximately 83,000 students, including 12,000 graduate students and 5,000 faculty located on twenty-four campuses. These campuses vary widely in character, ranging from the research campus at University Park to four-year liberal arts programs, two-year associate-degree programs, a graduate only campus, and two professional schools. The Libraries also supports the World Campus, a distance education program with current enrollment of 12,000. In addition, the Libraries provides a range of services to residents of Pennsylvania as part of its outreach commitment as a land grant institution.

- **The services must be robust enough to extend across the Libraries extensive organizational structure.** The campuses, and the Libraries, are administered centrally, as part of “one university, geographically dispersed.” With 550 staff members providing services across these twenty-four campuses and approximately 50 service points, we are challenged to build a service system to handle the potentially high volume of usage while also accommodating local variations in service policies and user expectation that exist in our complex environment. It has been useful to compare this environment to that of a library consortium, although without most of the complexity related to having multiple points of administrative authority.
Since the late 1990s the Penn State Libraries has been pursuing several initiatives to improve access to Web-based resources and services. The launch of a new integrated library system, the implementation of a pilot synchronous reference service, and an expansion of an existing asynchronous reference services provided the Libraries opportunities to engage our users in designing new services based on an assessment and analysis of their needs. Within this environment of increased focus on our users, these various projects and initiatives converged into a unified concept for our Web-based services, a suite of services designed to provide ubiquitous, point-of-need user assistance without requiring that the user understand the complexities of our large organization. This new service was christened “Ask!” [ask.libraries.psu.edu].

With the implementation of the new integrated library system in 2001, a “Tell Us What You Think” button was available on the Libraries home page to solicit feedback and questions about the new system. Within a few months, we noticed that the traffic from the button moved from comments about the system to reference questions and requests for assistance (“How do I...?”). Analysis of the traffic coming through this button lead to two conclusions: First, the new interface to our catalog (The CAT) and, by extension, our overall Web site, was not intuitive to our users and second, the existing “Contact Us” and “Ask a Librarian” links on our Web site were not meeting user needs, most likely because they were not prominent or persistent enough in our Web pages for our users to find them.

Over the next twelve months a task force examined issues related to digital reference services and made recommendations to improve our Web-based services. These recommendations included improvements to the existing central “LibInfo” asynchronous reference service, making it more visible, with more robust staffing and resources, exploring technology options to manage the service, and expanding the service to improve referrals among the approximately fifty service points across the Libraries. At the same time, the Libraries synchronous, chat service was established after a successful one-year pilot project. With the launch of the “Ask!” service in August 2002, these services were brought together with our existing traditional reference services to provide our users with a suite of service options. In the Ask! concept (see Appendix I) the user selects an option for submitting a query based upon his or her need or preference (using chat, using email/Webform, contacting a librarian or service desk by telephone or in person, or a few other specialized options such as submitting a comment or recommending purchases for the collection). While the user has the option to contact a specific librarian or service point, he or she is expected to understand the organization well enough to determine where the query should go. Instead, the query is routed to the appropriate place, either through system programming or through staff intervention. Within this concept, we are set to accomplish two goals, building a user interface that functions as a virtual service point for library users, whether they are coming in remotely or from a library workstation, and building a reference system that functions across all library service points, using technology to improve the efficiency and effectiveness of the library staff.
ASSESSMENT AND USING DATA TO INFORM DECISIONS

As we have moved forward in developing a suite of Web-based library services, we have gathered information from our users, through analysis of queries received and other assessment tools including Web surveys in our catalog and Website, usability testing and protocol analysis, focus groups, and the Association of Research Library sponsored LibQUAL+™ project. Based on this accumulated data, we have made several observations:

- Our users submit complaints and questions about network access problems through this service. The service has become an important mechanism for us to track access problems for remote users. However, the information we get from our users is often inadequate to diagnose specific problems and we need to develop a more efficient method for collecting this information.

- Data from the LibQUAL+™ survey suggests that our users, and library users across the country, prefer to be self-sufficient in using the library, without having to ask for assistance. A question, then, is an indication of our failure to meet the expectations and needs of our users.

- When using the asynchronous, email/Webform service, our users are more likely to submit questions about services (interlibrary loan, renewal of library materials, course reserves) than subject based reference questions. This suggests to us that the user interfaces on our Web pages are not intuitive and that we must improve the usability of our Web-based services. Our goal is to make users self-sufficient in managing these transactions.

- A substantial number of questions are received from outside our primary user population of the students, faculty, and staff of Penn State. As a land grant institution we have an obligation to serve this secondary user community, but it requires balancing resources and, in some cases, developing unique resources to meet the needs of that user group.

- A substantial number of questions are related to University resources outside of the Libraries. In building the infrastructure to support these questions, we will need to collaborate with other campus departments, those with formal help desk services and those without.

Based on user feedback we have received, these new services are meeting user needs and expectations. Exit surveys in the synchronous chat reference service indicate that users like to interact with librarians in the chat environment and that the information and assistance they received met their needs. Informal feedback from the synchronous Web-based service suggests a similar response. The convenience of using email and the quick response time generally within a few hours, 24 hours at most) are seen as benefits by many users. In the current phase of development, we will be implementing a user-searchable knowledge base that will provide another resource for our users, supporting their self-sufficient use of the library.
From the library perspective we have seen several positive outcomes. The development process has fostered greater collaboration and cross-training across service units, both in applying diverse skills in technology, content development, and Web design to the project and in providing seamless support to users on all campuses. The increased flow of information from our users about network access problems has heightened our awareness of the growing need for technical support in our complex network environment.

INTEGRATED REFERENCE MANAGEMENT

The success of the “Ask!” concept is dependent upon using technology to build an integrated reference management system. As these services have evolved and expanded we have explored options for better managing the increasing traffic, gathering use and demographic data, and building a knowledge base. Not finding a suitable commercial product at the time of initial implementation, we moved forward with our IT staff on a locally developed system. Our experience with local development proved invaluable a year later when commercial products came available. In early 2003, the Libraries signed an agreement with LSSI to implement their new RefTracker system and to collaborate with them on adapting the software to the large research library environment. The new software supported these management functions and supported a more robust referral network for our multiple email/Webform services than we had been able to build in the local system. In addition, it provided a software link to our synchronous chat service allowing us automate the transfer of chat transactions into an email session, to support in-depth questions that take more time or require attention by a specialist.

Originally the user interface and subsequent transactions were organized by question type. This decision was based on the earlier analysis of “Tell Us What You Think” transactions. As the service evolved we found through further analysis of the data and the workflow that the area of expertise or local knowledge required to answer the question was becoming important. In our consortium-like organization, this equated most closely to location. This lead us to shift our primary method of categorizing data from question type to service point location. This also lead to a major change and simplification in the user interface where the user now selects how they wish to communicate (chat, email, in person, telephone, etc.) rather than trying to decide what type of question they wished to ask. The system is able to track location through software settings, URL parameters, and from voluntary user-provided information. While the programming can direct many of the queries to the appropriate answerer, staff intervention is also an important component of the referral system. The conversion from our locally developed system to the commercial RefTracker system, which has a more robust data collection and reporting structure, allows tracking of use by user type, location, and other criteria. This information will allow even closer measurement of changing use patterns, facilitating the adaptation of the system to user behaviors and preferences.

Beyond the more traditional reference service provided by Ask!, the system also serves a technology help-desk function, which grew out of the original “Tell Us What You Think” system. We found that our users were turning to our digital reference services for help with technical problems with library databases and other resources. Using the locally developed system, we were able to customize a Webform specifically for technical problems. This form prompts users to provide specific information, including browser type, database used, access
method, authentication method, and error message. We found that the commercial software
could not be configured enough to collect data at this level of detail. Until an alternate method
exists for collecting the required information, the locally developed system runs in parallel with
the RefTracker system for specific uses. Having two systems in operation has required some
additional staff time for monitoring query streams. It has also required supporting two
knowledge bases, and doing local programming to support searching across both of them.

Data sharing and question referral across separate systems is our goal. Limits to interoperability
occur due to the limitations of commercial products that are not designed for complex
organizational environments. Additionally, NISO standards for data exchange between systems
are still under development, so communication between different vendor products or local
systems is not guaranteed. Penn State is pushing the envelope of digital reference technology to
influence future software development. We envision an environment where data from knowledge
bases is passed between systems to produce FAQ services within our content management
system and where user queries can be passed between digital reference services to library or
Penn State help desk systems. As new products emerge they should be assessed with
interoperability in mind.

FUTURE DEVELOPMENT

As early implementer of an integrated reference management system, our experience will be of
interest to other libraries wrestling with the same issues: building a common reference interface
that works across a decentralized organization; building an infrastructure that assists in managing
and tracking queries to the system; addressing privacy and intellectual property issues related to
these services; assessing user expectations for 24/7 services. Our collaboration with
LSSI/Altarama to adapt the software to the large research library environment will investigate
how system design and workflow issues as well as examining pricing models based on levels of
use in our decentralized environment. The collaboration will also extend into further
development of functionality within the knowledge base. We also anticipate that the data we
collect in this project will inform broader discussions of how our library, and other libraries,
might benefit from better, more robust management information systems.
ENDNOTES


2. The ARL E-Metrics Project (http://www.arl.org/stats/newmeas/emetrics/index.html) is addressing the need for comparative data on use of electronic resources.

3. This national program (www.libqual.org) is a web-based survey and supporting resources designed to help libraries assess and improve library service quality, raise awareness of the importance of assessment of library services, and to benchmark library service quality across institutions.


7. In late 2003, the developers of the RefTracker software, Altarama, dissolved their relationship with LSSI, Inc. to distribute the software in the United States. Altarama is now the sole distributor of the RefTracker software (http://www.altarama.com.au).
APPENDIX 1: ASK!” CONCEPT

User Responsive System
Ferm Input/E-Mail Response

User-Controlled

User chooses the medium/mode, asks a question

Medium/Mode

Chat

Web-to-Email

Vendor DBs

Local Web Site

Library Web Site

The CAT

Directories

FAQ/Self-help

Access Point

ASk!

Internal Reference Management System

Library manages the process

Library Pool

Local, Direct Contact

Responder

Resolution

Answer Immediately

Go to Knowledge Base

Question can be reopened

ANSWER