Case study: the Health SmartLibrary* experiences in web personalization and customization at the Galter Health Sciences Library, Northwestern University

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**Question:** How can the user’s access to health information, especially full-text articles, be improved? The solution is building and evaluating the Health SmartLibrary (HSL).

**Setting:** The setting is the Galter Health Sciences Library, Feinberg School of Medicine, Northwestern University.

**Method:** The HSL was built on web-based personalization and customization tools: My E-Resources, Stay Current, Quick Search, and File Cabinet. Personalization and customization data were tracked to show user activity with these value-added, online services.

**Main Results:** Registration data indicated that users were receptive to personalized resource selection and that the automated application of specialty-based, personalized HSLs was more frequently adopted than manual customization by users. Those who did customize customized My E-Resources and Stay Current more often than Quick Search and File Cabinet. Most of those who customized did so only once.

**Conclusion:** Users did not always take advantage of the services designed to aid their library research experiences. When personalization is available at registration, users readily accepted it. Customization tools were used less frequently; however, more research is needed to determine why this was the case.

**STATEMENT OF CASE**

From September 2003 to December 2008, the Galter Health Sciences Library staff launched and maintained a web service called the Health SmartLibrary (HSL). The goal of the HSL was to deliver health information, primarily full-text journal articles, directly and quickly to users, especially clinicians. The primary HSL concept was to save users time in finding scholarly information to support quality patient care. However, because saving time is useful to all health sciences library users, the HSL also served researchers, staff, and students. This case study reports on HSL registration and customization data, the consequences of developing a value-added service, and the implications for the role of academic health sciences librarians.

**BACKGROUND**

Supported by a grant from the National Library of Medicine (NLM), the HSL was built around the concept of portal development, with special emphasis on web-based personalization and customization. Modeled after commercial services such as My Yahoo!, the HSL was built to respond to users’ need to take control over their information environment. The HSL was designed to provide better organization, faster access, and more efficient searching in order to create a structured, value-added, online service. Librarians would not only provide access to an online collection, they would aid the users’ research experience by directing access to focused information.

Over the years, numerous articles have described web personalization and related customization services. Marsden identified the basic premise behind web personalization and customization [1], while Zhou traced the history and development of web portals in libraries and defined portals as “a doorway that can be customized by individual users to automatically filter information from the web” [2], thus making portal development synonymous with web customization. Libraries began adopting web personalization innovations as digital libraries grew in size and complexity. Ciccone [3], Morgan [4], Ghaphery [5], Gibbons [6], and Guenther [7] described how the My Library concept was implemented at their respective institutions and how those projects were received by their communities. Web personalization and customization remains relevant. The 2009 Horizon Report identifies the personal web as “a collection of technologies that confer the ability to reorganize, configure and manage online content rather than just viewing it” [8]. The report suggests the personal web will be more prominent in the next two to three years.

This selective literature review reveals a perceived need to assist users so they can more easily manage digital library resources. The My Library model uses staff programming skills to build innovative, web-
Based tools; however, Ciccone [3] and Gibbons [6] commented that not many users take advantage of these new tools. To increase use, the HSL was designed to incorporate personalization as part of online service registration and to provide easy-to-use customization features that would immediately change the users’ HSL to one that was uniquely their own.

‘Personalization’ can be defined as the design, development, or creation of web pages whose common content is shared among a group with mutual interests in the same content. The larger Galter website contains more content than one person wants to know or manage. The personalized HSL was designed to reduce this larger content set for an individual by offering a specialty profile relevant to the user’s interests (e.g., cardiology). “Customization,” in the HSL context, occurred when an individual user changed the preselected library resources in the profile so that these resources became unique to that individual.

**METHOD**

The four HSL tools were designed and developed by a team of library staff and medical school faculty. Earlier work described the development process of these tools in detail [9–16].

The HSL was built on the library’s internal electronic resource management database. Starting in 1995, electronic journals have been managed at the Galter Library using ColdFusion and a Microsoft Access database. Later, when a homegrown interlibrary loan (ILL) system was implemented for user-initiated borrowing requests, patrons were required to register and log in to use this ILL service. The same system was used for remote access to the digital library. Thus, a table of patron information for some 5,000 users already existed in 2004. This table also included the patrons’ specialty preferences.

**Health SmartLibrary tools**

My E-Resources, the primary HSL tool, was displayed in the center of the users’ personalized pages. Here, the users saw links to the essential journals, books, databases, and websites in their specialty profiles, assigned according to the specialties users had indicated at registration. My E-Resources brought the full text of highly desired electronic resources directly to the users’ home pages, thus eliminating additional clicks to find the same resources in the catalog or the e-resources database.

Cognizant that most people are reluctant to customize a web service on their own, staff created the specialty-based HSLs so users could see the relevance of the personalization concept in action. This effort demonstrated the HSL’s capabilities and induced patrons to select a personal HSL. Once selected, users could start customizing their own HSLs by selecting the online journals they read most often or discarding the preselected journal titles in favor of their own selections.

Several criteria for selecting quality resources for the specialty profiles were used. E-books were selected based on the former Brandon/Hill lists [17], ratings in the Doody Review Service, and traditional presence in the library’s core reserve collection. E-journals were selected based on their indexing in PubMed and their impact factor from *Journal Citation Reports*. Other websites and databases were selected based on their perceived usefulness in meeting users’ information needs in a particular specialty. Selection was also derived from the librarians’ encounters with users via reference questions and liaison interactions with the medical school departments. Specialty profile selection demonstrated the librarian’s role in filtering quality resources to aid timely responses to users’ information problems. For example, the Galter collection had more than eighty-five resources for pediatrics, but staff chose only eighteen titles for the profile.

Stay Current was a current awareness search in PubMed and complemented My E-Resources by highlighting selective articles from journals in the specialty profiles or in other journals to which Galter subscribed. Stay Current was available to anyone who logged into their HSLs. The five most recently published articles in each journal were displayed; only one click was required to obtain the full-text. Users could further customize Stay Current by creating a customized subject search. Stay Current complemented current-awareness searches that users created from databases other than PubMed; however, the Stay Current feature appeared on the users’ HSL pages, while current awareness search results from other databases were usually emailed, thus requiring users to take additional steps to find and retrieve full-text articles. To help users ‘stay current’ on new books, Stay Current linked to Doody Book Reviews based on the users’ specialty profiles. When users were off-campus, the Stay Current tool automatically “proxied” the individual so they could retrieve full-text links to literature searches.

The Quick Search keyword search engine worked across various library resources. The intention was to facilitate user access to the most appropriate resource, especially when users did not know which specific resource would contain the information they sought [18]. The default Quick Search included preselected resources for each specialty profile. PubMed and the online catalog were in every Quick Search list unless users removed them in the customization process.

Quick Search proved to be the most difficult tool to create and maintain. Developed before metasearch or federated search tools became prominent, cooperation with various publishers was needed to locate a specific resource’s keyword index so that Quick Search could access it. Unfortunately, cooperation was not always forthcoming. Without access to all the indexes, the keyword search was limited at best, with only a small number of databases available.

File Cabinet was a unique feature that provided online storage of a user’s favorite uniform resource locators (URLs), equivalent to a bookmarking service. File Cabinet allowed easy and fast retrieval of web-
based information. Unlike bookmarks, which are machine specific, the File Cabinet opened wherever users logged into their personal HSLs. The File Cabinet was truly personal in that each user was free to organize the cabinet’s contents.

Altogether, the HSL services (Figure 1)—when combined with additional services in the area of remote access, document delivery services, interlibrary loan initiation [19], and online registration for library instruction sessions—created a complete information portal. Building on this foundation, the HSL service allowed patrons to customize their personal online library through the development of a back-end system that created tables linking patrons with the whole range of electronic resources and/or with generic PubMed search strategies for current awareness topics. In addition to the linking tables, staff also created the public interface for users to customize each of the four HSL tools. Edit links were located on the website’s main navigation bar and in the tools themselves.

The editing interface for each tool allowed users to select or deselect from a list of resources or other options. Whatever choice users made became immediately apparent in the HSL; thus, the personal HSLs became uniquely individual.

Analysis

The customization statistics were calculated from data stored in a local database that included the HSL patron database and a customization table for each tool. Whenever registered users customized or made subsequent changes to a particular tool, the change was logged in the database. SQL queries were written to gather the statistics.

Approximately one year after the launch of the HSL (2005), staff conducted an analysis to study the customization habits of a select set of users. The project goal was to determine if there was sustained use of the tools over time. A report was generated to identify users who had customized a tool in January 2005 and were still active users in December 2005. Data from each quarter were compared to determine if users continued to customize or change their tools during the twelve-month period.

Two web-based surveys were conducted to evaluate the HSL. A 2004 survey, posted to the home page, asked a series of questions and solicited open comments that concentrated on overall satisfaction, perceptions, features, and any problems using the tools. Survey topics included general impressions, ability to control information access, and perceptions of time saved accessing and processing health information. Galter staff conducted a second survey in 2006. Its purpose was to measure user familiarity with HSL tools.

RESULTS

In May 2004, 6,041 users were registered, and by December 2008, 9,550 users were registered. These registrations indicated users’ interest in accessing the electronic library for online resources and services, such as proxy access and ILL service, and were not exclusive to the registration for a personal HSL. Registered users were measured annually following...
patron database purges. The patron purge removed from the database all users who were no longer affiliated with the Galter Library. Out of a 2007 medical school population of 25,702 [20], 5,429 were registered HSL users (21.12%).

Customization usage

Using customization statistics gathered during the life of the HSL, My E-Resources was the most popular tool to customize, followed by Stay Current (Table 1). Health sciences faculty were the largest customizers of My E-Resources, followed by residents and medical students. Customization use increased during the life of the HSL service. In 2004, 224 faculty members, 52 residents, 67 others, and 50 undergraduates (MD curriculum) customized My E-Resources. By 2008, these same groups greatly increased their use of the customization feature for My E-Resources: 1,251 faculty members, 894 residents, 742 others, and 701 undergrads.

Customization of My E-Resources grew steadily from 7.71% of registered users 6 months after the HSL was launched in November 2003 to 32.72% in 2005, 45.53% in 2007, and 44.21% in 2008 (Table 1). Other HSL tools were customized less frequently. While Stay Current was the second most customized tool, its customization fluctuated between 39.55% in 2005 and 8.54% in 2007. Quick Search and the File Cabinet were rarely customized. Customization of the Quick Search tool ranged from 2.11% to less than 5% among registered users. The File Cabinet tool was customized by 2% of registered users during the life of the HSL.

In the 2005 analysis, of the 217 users who customized My E-Resources, 41% made changes to the tool over the year. Approximately 1% of the 217 users reverted back to the specialty profile for their disciplines. The remaining users (58%) did not make any subsequent changes to the tool; in other words, these users customized their My E-Resources once and kept that change through the year. The Stay Current tool had 111 users who had customized the tool as of January 2005. Of those users, 23% continued to make changes to the tool over the year, 2% reverted back to the specialty profile, and the remaining 75% did not make additional changes to the tool during the year.

Evaluation

Seventy-eight of the 6,041 registered users answered the 2004 survey. Results (Table 2, online only) showed primary users satisfied with the value-added services. Clinical faculty (30, 38.46%) rated the HSL an average score of 4.4 on a 5-point scale for ease in gaining control of health information access. Clinical faculty also rated almost all aspects of the HSL tools higher than any other survey population. Positive criticism from the survey’s open comments gave staff ideas for improving the HSL tools, such as “Quick Search is not quick. It’s slow”; “File Cabinet is very useful for making quick links to things I use often”; “It would be useful to be able to alphabetize the journals in My E-resources”; and “The health smart library is an outstanding start. It needs refinements related to customization.”

In preparation for a proposed HSL redesign, Galter staff conducted a second, web-based survey, posted to the home page in 2006. Over 297 of 5,429 users responded, and of those, 162 (54%) did not know about the File Cabinet tool, 99 respondents (33%) did not know about the Stay Current tool, and 90 respondents (30%) did not know about the Quick Search feature. The most recognized tool was My E-Resources, with only 33 users (11%) who did not know that it existed. The My E-Resources tool was marked by 81 users (27%) as one of the primary reasons why they visited the website.

In addition to measuring overall satisfaction, Galter staff tried to verify a key premise of the original grant application: Whether by adding value to online services, the library staff could actually save users time through more direct connections to full-text literature that would be useful to their work, especially patient care. Measuring time saved by using HSL tools proved to be elusive. Open comments from evaluation surveys could only measure anecdotally that users perceived some time savings when using the new HSL features compared to the old website.

DISCUSSION

Several important lessons can be derived from the HSL experience. One valuable lesson is recognition that users do not always take advantage of the services designed to aid their library research experience. When users describe their electronic library experiences in survey responses and reference interviews, they often express amazement at what the library makes available to them once it is explained, shown, or demonstrated. A critical lesson from the HSL experience is that libraries must sample users carefully for a better and clearer understanding of
their information needs and then target announce-
ments, demonstrations, and promotional messages
frequently to users regarding service improvements.

Another lesson is that the need for customization
may vary from one individual to another. Some users,
for example, do not necessarily need a personal File
Cabinet to organize their online articles, book refer-
ences, or web URLs. At most, the usage described in
this case study demonstrates that some users are
interested in self-management of key library resourc-
es. For the users who did not customize an HSL tool,
no judgment of the value of the tools can be inferred,
because it is not known if users used the tools and did
not like them, simply ignored them, or did not
understand how the tools would help them. More
research is needed to understand the factors under-
lying use or nonuse of customization tools by users.

In the NLM grant that funded this research, the
Galter Health Sciences Library developed tools to
give away the HSL code as a means of promoting web personaliza-
tion and customization as an alternative to the My
Library model. The intention was that by joining
forces and pooling programming talent, an HSL
consortium of like-minded library staff interested in
collaborating on how best to deliver web personali-
zation and customization tools would keep the
concept moving forward. The HSL model was not a
"plug and play" system; it was inherently complex
and required staff programming skills to integrate
HSL tools into library website functionality. The
complex design and a lack of available staff program-
ing skills might have dissuaded peers from pursu-
ing the HSL style of website personalization and
customization. An effort was made to announce the
availability of the HSL code to peer libraries. Based on
the lack of response from peers, one of the lessons
from the HSL experience was confirmation that
libraries need access to programming skills either
among the staff or in collaboration with others for
developing in-house, online user services. It is also
possible that local libraries preferred to develop their
own brand of web personalization and customization.

At Galter, the availability of programmers—from
the library staff and collaborating medical school
faculty members—made the HSL a success among its
users. The use of local talent directed toward
operating an electronic library was a fundamental
management decision. Without this talent, the HSL
innovation would not exist nor would its evolution
continue.

The role librarians can play in directing users’
attention to quality information resources is another
lesson of the HSL experience. Librarians can use tools
and personal experience to filter information available
to users. The librarian’s selection skills can support
users so they do not succumb to information
overload. Users crave convenience in intense envi-
nronments like a clinical setting, and the librarian’s role
is to provide a service that identifies objective and
reliable resources.

Nevertheless, the vision of making information
resources easily accessible to users and pushing
quality information remains important. From the
beginning, a major goal of the HSL was to save users
time by making full-text articles more evident when
users, especially clinicians, came to the library’s
website seeking scholarly information. Saving users’
time was the intention behind developing the Stay
Current tool and presenting the full text of leading
clinical journals (JAMA, New England Journal of
Medicine, BMJ, and The Lancet) on the library’s home
page. By pushing the literature closer to the user—
without the user spending time on searches—time
and effort can be saved and used for more important
clinical endeavors.

Adding value to the users’ library experience was a
goal and a product of the HSL implementation.
Because the library’s vision is to connect to users
electronically, librarian skills and services are now
directed more toward whatever means will add value
to the online library experience. The goal of adding
value is to make a difference to the user. Library work
is all about connecting users to information, and
making information access convenient and informa-
tion usable remains an important and significant role
for the library staff, a lesson confirmed by the HSL
experience.

FUTURE DEVELOPMENT

In the years developing, using, and maintaining the
HSL, surveys indicated that users rarely understood
the HSL brand. Users recognized the web service
most important to them, namely, finding and accessing
the journals, books, and databases critical to their
interests (i.e., My E-Resources), and they valued this
service as part of the library’s own brand. The HSL
brand, on the other hand, did not communicate the
added value provided by services like Stay Current,
Quick Search, or File Cabinet. Consequently, the HSL
label has been dropped.

The HSL has been upgraded and redesigned for
easier maintenance and more usability. Features
formerly provided in My E-Resources are now
contained in GalterLists. GalterLists incorporates
Web 2.0 personalization and tagging features and
allows users to share their personal list of resources
with others; this feature is especially helpful to faculty
compiling reading lists for students or residents.
Librarians will continue to supply preselected, spe-
cially-based resource lists for users who need them.
These lists will be the starting point for all customized
services on the new library website. Stay Current is
now incorporated into GalterLists, as is the File
Cabinet. Quick Search, an idea ahead of its time, will
be replaced by commercial software that specializes in
federated searching across many resources. Further
customization features will be planned based on user
feedback.

CONCLUSION

The Galter Health Sciences Library developed tools to
personalize and customize the users’ experience at the
library’s website. These tools include My E-Resources, Stay Current, Quick Search, and File Cabinet. Measurement over the last five years showed that some tools were customized more often than others. My E-Resources was the most frequently customized; the other tools were less often customized. The importance of the library’s goal of adding value to the users’ search experience was supported by the number of users who registered for the HSL and customized their e-resources. Evidence that the HSL succeeded in saving users’ time when searching for full-text information was less conclusive; anecdotal survey information suggested some users might have saved time through web-based personalization and customization.

The HSL has now evolved into GalterLists and remains a value-added service to users, especially for those who visit the electronic library daily or want to customize their scholarly information resource selection. What other librarians can learn from the HSL experience is that value-added services will be accepted by users if they meet the user’s information needs, are convenient to access and easy to use, and are promoted frequently. In addition, programming talent, either among the library staff or in collaboration with others, will be in more demand as librarians continue to build and develop the electronic library.

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