Designing for Information Discovery: User Needs Analysis

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*T*he proliferation of information online has created new challenges in information discovery. For JHU libraries, retrieval of "known items" (i.e., known title or author) has improved as a result of upgrades to the catalog and the addition of helper services that link a citation to the full text. On the other hand, locating information has become more complex when the information need is not well defined (i.e., an exploratory search[1]); when the search is in an interdisciplinary area; or when the need is problem-based. Our millions of electronic and print resources are fragmented across countless systems, each with an idiosyncratic search interface, widely varying coverage, and few bridges from one platform to another. We have also learned that the JHU libraries' catalog software (both the user interface and the back end collection management database) will not be supported in the next few years. We are building a discovery tool to overlay the many disparate sources and to facilitate both retrieval of known items and exploratory search. This brief article reports on our empirical work to understand the needs of the users of the JHU libraries and the resulting tools we have built to support the design and implementation of the new discovery tool.

APPROACH

Before selecting or building a tool, we needed to (*i*) know more about how JHU affiliates seek, find, acquire, store, organize, share, and re-use information; (*ii*) develop requirements; and (*iii*) craft "personas"—archetypes representing groups of users—for use in design and testing. Accordingly, in the spring of 2008 a group of nine librarians from all JHU libraries launched a large research project. We interviewed 78 JHU affiliates who represented the widest possible variety of seniority, research area, and demographic characteristics (see Fig. 1). Using critical incident techniques,[2] we asked participants to focus on a recent occasion in which they needed information and then to describe the steps they took to identify information sources and locate, save, share, and re-use information. In some cases, we were able to observe their processes and view their file systems and work areas. We paid particular attention to the tools they found most useful and the issues they faced in their processes. We analyzed the notes from the interviews, extracting common themes, tools, and approaches.[3] These themes, tools, and approaches were further analyzed to develop personas and a list of desired features.

RESULTS

Analysis of the interviews resulted in two immediate deliverables: a list of desired features and personas to be used in design and testing.

Features List

We identified general features as well as more specific features related to search, display, and personalization. The system should support author searching, advanced keyword searching, and full-text searching and then provide specialty options such as music composer searching

Figure 1. This word cloud shows the frequency of terms used by participants when discussing their searches for and use of information. Words in larger font size occurred more frequently in transcripts and notes. Created at http://www.wordle.net.

and chemical structure searching. Besides the typical fields displayed, the participants asked for indications of how long it would take to get the full text. For example, the system should indicate if the article is available upon clicking, by walking 5 minutes to the library, in a few days from another JHU library, or in 2 weeks from an external source. We had expected users to want these features, but did not expect the level of personalization they desired. Libraries traditionally value the user's privacy over personalization, but the participants indicated that they are willing to trade some privacy for features like wish lists and recommendations that carry over from one session to the next. The feature list was converted into a matrix for use by the product evaluation team.

Personas

A smaller team analyzed the interview notes and identified patterns within themes. Clusters of themes were then identified and used to divide users into segments or categories, which became the basis of the personas. Personas are archetypal users that represent the needs, goals, values, and behaviors of larger groups of users.[4] These personas were used to help guide us in making decisions about the design of software and thus to avoid building what we only think users want. The personas will be used to confirm decisions upon implementation and enhancement of the discovery tool over time.

CONCLUSION

This project demonstrated successful collaboration among librarians from all JHU libraries. The information collected from the interviews revealed commonalities among our users despite the obvious differences (e.g. age, role). Analysis of the interviews provided a basis for system selection and design, and since then a discovery tool has been selected. Customization and new programming are required to incorporate the desired features identified in this research into the new tool. The personas were used throughout the selection process and will be used in interaction design as the tool is implemented. A final report of the study and results is in preparation.

[1]Marchionini, G., "Exploratory Search: From Finding to Understanding," *Comm. ACM* 49(4), 41–46 (2006).

[2]Radford, M. L., "The Critical Incident Technique and the Qualitative Evaluation of the Connecting Libraries and Schools Project," *Library Trends* 55, 46–64 (2006).

[3]Patton, M. Q., *Qualitative Research and Evaluation Methods*, 3rd Ed., Sage, Thousand Oaks, CA (2002).

[4]Brown, D. M., *Communicating Design: Developing Web Site Documentation for Design and Planning*, Peachpit Press, Berkeley, CA (2007).