

Use a Shoehorn or Design a Better Shoe: Co-Design of a University Repository

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ABSTRACT

Faculty members are offered a repository for storing work in digital formats but do not immediately see its value. The authors' research identifies a range of faculty needs for web-based services to support their research activities and academic roles. The authors discuss the dilemma of launching a digital repository when the faculty members' experience of their needs as a unified whole does not line up with the way the repository platform isolates a subset of those needs and attempts to address them separately.

Categories and Subject Descriptors

H.5.2 [Information Systems]: User Interfaces – *user-centered design, theory and methods*

General Terms

Design, Human Factors

Keywords

Institutional repository, library, work-practice study, user needs

1. STARTING AN INSTITUTIONAL REPOSITORY AT THE UNIVERSITY OF ROCHESTER

When the University of Rochester's River Campus Libraries wanted to set up an institutional repository, we selected DSpace as our platform [4]. We assumed that our repository would help us store and disseminate scholarly materials in digital formats. Faculty would use DSpace as a place to put conference proceedings, technical reports, their students' dissertations, and maybe some databases and online journals.

We gave a librarian the responsibility of pitching the new repository to faculty and getting them to deposit their items into it. Using typical DSpace promotional language, our materials promised...

- Large-scale, stable, managed long-term storage
- Support for a range of digital formats

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- Visibility for research results
- Persistent network identifiers
- Flexible and simple submission process
- Search and delivery interface
- Digital preservation services

After the initial out-of-the-box installation of DSpace, we began a work-practice study to help us customize the interface [1,5]. Meanwhile, faculty members were not jumping at the chance to put their work into DSpace. And our research gave us a good idea why. The expert view of DSpace, and the language used to present it, do not line up with how faculty and researchers work and what they might need in the way of web-based services for their scholarly work.

As we will show in this paper, faculty members do not think in the same terms as archivists or programmers. While this is not surprising, given that they do not do the same kind of work, it does pose some challenges to our repository project. How do you implement an institutional repository that works well for faculty when the best existing products - such as DSpace - are designed to meet the goals of institutions, not users?

2. PARTICIPATORY DESIGN IN A UNIVERSITY LIBRARY

We saw the DSpace implementation as our opportunity to add the methods of work-practice study and participatory design to the usability work that the library was already doing. Specifically, this would help us optimize the repository for our university, by customizing or enhancing the interface in response to user habits and needs. More generally, it was our opportunity to introduce exploratory research and the practice of including users in even earlier phases of design and development [3].

Both of the authors had conducted work-practice studies, although in different contexts. Nancy, an anthropologist with field experience in South America, Europe, Melanesia, and the United States, had done long stretches of participant observation augmented by time allocation, budget, and work process studies. Dave, a computer scientist, had spent several years at Xerox, including a stint at the Palo Alto Research Center (Xerox PARC). He had done many video-based work-practice studies in connection with product co-design and co-development, including a study in the library of the Rochester Institute of Technology.

The Institute for Museum and Library Services granted support to train a group of librarians to do work-practice study in the context

of DSpace implementation and enhancement, and we began the project in September 2003.

3. THE DSPACE WORK-PRACTICE STUDY

The DSpace project entails studying user interactions with digital tools and exploring the organization of work in virtual and physical workspaces. We have been working with a core team with overall responsibility for project tasks. This team includes two librarians, a computer scientist, an anthropologist, a programmer, and a graphic designer. We also have a project team, which comprises the core team plus four reference librarians and a cataloger. With the help of a consultant, Dr. Françoise Brun-Cottan [2], we oriented all team members to work-practice study and taught them basic techniques, and some of the valuable insights of careful observation, through mini-ethnographic projects. After initial training, project team members began working with the anthropologist to videotape the interviews.

We have done all of our primary data collection in the context of interviews, documenting all interviews on video, transcribing the audio tracks, and transferring the video to DVD. We have completed about thirty interviews so far with faculty in a range of science, social science, and humanities disciplines. All team members read as many transcripts and view as many videos as time allows.

As we have conducted and transcribed the interviews, we have analyzed them, usually in the context of discussing research questions or doing an activity together. For example, we have used interview transcripts to create storyboards of three faculty research projects from concept to publication, and then returned to the faculty members to discuss and improve their storyboards. We have also engaged in "blue sky" brainstorming, for example when we imagined that we were faculty members and could magically have and use any tool that would make our research easier or more effective. The result of these sessions was more than 150 different ideas, from general ideas about what faculty members want and need, to specific ideas for possible enhancements to DSpace software.

4. INITIAL DIRECTIONS

Remember that we undertook a work-practice study so that we could customize and enhance a digital repository. Therefore, our early work centered on brainstorming faculty needs and ways to meet those needs with modest improvements to the interface. A huge proportion of these ideas turned out to center on authoring. For example, many faculty members have experienced computer crashes and have lost their work; they need safe storage for work in progress. They have huge issues with version control, especially when they work with other authors, who are often at other institutions. They want to access their work in progress from any number of computers: office, home, portable. They want to control who can see and use their work, whether a select few or the whole world.

But those are needs for an authoring, sharing, and archiving environment, and DSpace is an archiving platform. So we decided to table those needs and to limit ourselves to enhancing the usability of DSpace's archiving functions. After additional brainstorming, we developed a People Page, an enhanced version

of My DSpace designed to make it easy for faculty members to archive their work.

In the process of bringing prototypes to faculty members and having them manipulate the page elements, we have been struck by the lack of fit between what faculty members want and need and how they work, on the one hand, and the current capabilities of the DSpace product, on the other. DSpace is a good idea and DSpace's open-source, partnership approach is yielding a robust product. But while universities need them, it is the rare faculty member who hears "institutional repository" and gets excited, even though it offers benefits that they truly need. This realization caused us to question our decision to table authoring needs. Even if we could not meet authoring needs with our first product, we felt we had to understand them more fully to do a good job.

5. THE GAP BETWEEN USERS AND EXPERTS

Librarians think "archive" and "preservation." Programmers think "repository" and "functionality." Faculty think "read," "research," and "write." We were offering faculty an archive but that was not really what they needed. What if we could take a systematic approach to providing what they really needed, with both authoring and archiving features provided through a simple interface?

We permitted ourselves to let go of the DSpace concept for a little while. Instead of thinking purely of the archiving function, we decided to list faculty needs in the context of a web-based service, provided by the library, to support their scholarly work. This list did not start with an archive; indeed, it did not even include an archive. Nor did it include most of the seven features listed in the sales pitch.

The following partial list gives a flavor of what faculty members want in terms of web-based services related to scholarly work...

- Access to their own work from different computers
- A truly safe place for their data and documents
- More order and less chaos in their personal cyberspace
- Easy online access to dissertations
- The ability to share their own work in progress
- Support for writing with other authors
- An easy way to share finished work

Then, we took one item from the sales pitch – persistent identifiers – and traced out its relation to faculty needs.

When we present DSpace to faculty members, we tell them that DSpace has persistent identifiers and that they need DSpace because it has them. Or, we might say that they need DSpace because it has a feature that "keeps links from breaking." But faculty members have never complained to us of broken links, much less a lack of persistent identifiers. They complain that it's hard to find things. Addressing the broken link issue is a system requirement, not an expressed user need. Moreover, persistent identifiers are a necessary but not sufficient piece of solving the broken link problem. To prevent broken links, the institution must make a commitment to maintaining and upgrading the server, using an intermediate resolution service, and so on. On the map of

user needs and system design, persistent identifiers are very far away from prospective users.

But there is more to this than recruiting users by speaking their language.

6. LARGER ISSUES IN THIS PARTICIPATORY DESIGN PROJECT

Like others in the DSpace community, we assumed that the institutional repository concept was a straightforward solution to user needs. We felt confident that our seven selling points spoke directly to faculty. However, our work-practice study revealed unmet faculty needs with regard to web-based services for scholarly work. Our assumptions did not match reality. Faculty members were not putting their scholarly work into DSpace and many real needs, including authoring and archiving needs, went unmet.

Our next step is to create the map that starts with faculty, institutional and library needs, moves to system requirements, and then goes to system specifications. Our hope is that repository experts will be able to design the system to support several of these needs. This system may take some time to build, so in the meantime we will complete the enhanced My DSpace page to support our new strategy for building the DSpace collection. This strategy entails working with nodes of early adopters, faculty members we support in using DSpace and who are closely linked through interdisciplinary programs to other prospective users. These early adopters are working with us, through a participatory design process, to ensure that My DSpace speaks directly to faculty, in their language, and to their preferences. The enhanced version of My DSpace will be the shoehorn.

Our ambitions now far exceed our original scope but we believe that we can build a combined authoring/archiving environment. It will meet the broader faculty needs that we have been able to

identify only through participatory design. This will be the better shoe.

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8. REFERENCES

- [1] Blomberg, J., Giacomi, J., Mosher, A., and Swenton-Wall, P. Ethnographic Field Methods and their relation to design. In Schuler, D. and Namioka, A. (eds.) *Participatory Design: Principles and Practices*. Lawrence Erlbaum Associates, Mahwah, NJ, 1993.
- [2] Brun-Cottan, F., and Wall, P. Using Video to re-present the user. *Communications of the ACM*, 385, 5 (May. 1995), 61-71.
- [3] Dawson, M. Anthropology and industrial design: a voice from the front lines. In Squires, S. and Byrne, Bryan (eds.) *The collaboration of Anthropologists and Designers in the Product Development Industry*. Bergin & Garvey, Westport, CT, 2002.
- [4] Massachusetts Institute of Technology. "Introducing DSpace." About DSpace. Accessed 11 June 2004. <<http://dspace.org/introduction/index.html>>.
- [5] Rubin, J. *Handbook of Usability Testing: How to Plan, Design, and Conduct Effective Tests*. John Wiley & Sons, New York, NY, 1994.