

**University of Michigan DSpace (AKA Deep Blue) Usability Studies: Summary Findings
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In the past few months, and in preparation for its formal launch this spring, the University of Michigan performed three rounds of usability testing on Deep Blue, its modified version of DSpace. We have made dozens of changes to our original design as a result of these tests, and have many more to make. While some are—or at least may be—idiosyncratic to the way we have implemented DSpace and the way we intend its use here at Michigan, others are probably of interest to the DSpace community as a whole.

The first involved testing with so-called expert users drawn from library staff who were quite familiar with the concepts of institutional repositories, metadata, self-submission, and search/browse. The second, which followed up on the findings from the expert testing and modifications we made as a result of their findings, proceeded in two parts: Undergraduate and graduate students worked through discovery tasks intended to test the search and retrieval of items in Deep Blue, while faculty tested the deposit interface. (We use the term “deposit” instead of “submission” here—see below for rationale.) The third round of testing proceeded in parallel with the second, and was conducted by a group of students at the School of Information for a class on usability testing. They applied a number of techniques to our interface, including a heuristic evaluation, vocabulary analysis, and direct user testing.

I’ve broken down our results into some broad categories, and summarized them in the form of bullet points with comments. If you have any questions—or better still, suggestions on how you fixed or otherwise improved a problem area we identified!—please send them to Jim Ottaviani, jim.ottaviani@umich.edu

Discovery (Search and Browse)

Make the search default boolean AND: Lucene’s relevance ranking is very good, but every major search engine uses a logical AND as its default operator when none are specified, so DSpace should conform to user expectations (i.e., enter more words, see fewer matches) in this regard.

Results pages:

- When no results were returned, we’ve removed the “1” (which implied page 1 of 1 to some, but not all) that appeared, since users found this extraneous/confusing.
- Many wanted to sort within retrieved results (by date, title, author). We hope to add this feature in the future.
- To be clear about what users should expect, we added a line indicating results are sorted by relevance.
- For the browse and search pages, we have attempted to provide better feedback/reminders of the action users just took. For searches: “Search Results from [community/collection name] for [string]”
- Ideally, put the just-executed search—e.g. ((title:image))—in the upper left search box so searcher can immediately edit/revise. We hope to add this feature in the near future.

Item pages:

- Provide the ability to contact authors directly, via email links. (This may be difficult, since some items are deposited by proxies. So we may investigate simply providing a link to the depositors. Regardless, we probably want to hide the specific contact information from the sender for privacy reasons.)
- Create a “bookmark this” link next to the handle at the top of an item’s page.

Collection pages: In general, we need to rearrange our implementation of a collection’s individual page to highlight action items, options (deposit, subscribe/unsubscribe). It appears that our current version is cluttered and presents too many options.

Tombstone: We have implemented code to provide tombstone functionality. (See <http://hdl.handle.net/2027.42/13907>) A better place for the tombstone message, at least in theory, is in the spot where the link to the bitstream/file used to be. (I say “in theory” since these messages can get long.) We are working on providing a menu of the “Removed by...” messages to choose from on withdrawal page, so that completing this step is more transparent.

Deposit (aka Submission)

Change “submit”/“submission” to “deposit”: We made this change early on, for two reasons. The word “deposit” is an all-purpose one that can substitute for both “submit” and “submission,” both of which imply that the item may not get accepted. But most works added to Deep Blue by their authors do in fact go directly into the system and become immediately available.

‘Deposit’ also works as a substitute for “archive” (as in “DSpace allows you to self-archive...”) which we think sends a subtly wrong, but still wrong, message. The institutional repository and the people responsible for it take care of archiving—end-users do not.

Change “My Deep Blue [DSpace]” to “Deposit/Edit an Item”: Also see below regarding the Profile and Email updates link. Until all of these features can be combined into one page, calling this link out by what it does gives users a clearer sense of what happens once they’ve clicked it.

Multiple “Describe” tabs confusing: Having multiple tabs all with the same label is confusing. Each should be distinctly labeled. We have not changed this yet, considering it a minor issue, but if possible we will change the first tab to “Begin”. We have made the default/traditional input-form.xml one page to reduce the number of “Describe” steps.

Also, the text and options on the first step confused some users—ideally, if an item has more than one file/bitstream, indicating that at the upload step is preferable to having to specify it here.

Change “bitstream” to “file”: Few users understood the term “bitstream” and none found it appropriately descriptive. (Typical question: “Does that mean ‘file’? Why not call it that?”)

Remove checksum information from the deposit form: Even fewer users understood why they should generate a checksum, or whether (and where!) they should keep it after having done so.

This relates to the submit/deposit/archive terminology discussion above: End users deposit, repository staff do the archiving, which includes validating file integrity and stability and dealing with long-term preservation and migration. While a few users may be interested in verifying the bit-level integrity of their deposits via checksums, we think that number is small.

License: This is an item for future testing. We want to test whether making the license agreement as the very first step of the deposit process makes more sense to users and/or has any effect on their willingness to deposit. Pro = This is typical with software downloads and could prevent frustration after entering piles of metadata. Con = Social engineering...depositors are likely to be more committed to completing their deposit once they've entered lots of metadata and uploaded their file!

Change "Cancel/Save" to "Cancel/Postpone" on all pages: This aligns the terminology with the confirmation page, which allows for the depositor to resume the work. To many "Save" implied that the work was considered complete.

Email notification: Upon successful deposit, put the title of the deposited item in the email subject line that Deep Blue sends.

Bugs fixed:

- Using browser's back button during upload of file resulted in multiple copies of the file being deposited.
- If a depositor was at the License step and then move backwards, if they tried to click on License step again it took them back to the very start of the process.

Other

Subscribe text: We changed this so it no longer implies that subscribers will receive daily emails, since some found this worrisome. ("I don't want to get messages every day!")

Subscriptions: Ideally, users would like to subscribe to particular authors in addition to/instead of collections. This will probably require significant programming.

Profile/Email updates/My DSpace: Ideally, all of these would combine on one page. Each page by itself provides relatively little functionality, and grouping all of these features together makes sense. This will probably also require significant programming.

Administrator Interface

In general, users found the administrator interface difficult to navigate, and the lack of verification for changes made to items/metadata was a problem for all. While few have or need administrator access on a regular basis, its infrequent use makes a clear interface all the more important. (Even when we assume that administrators will receive training on how to use it.)

Most of the things below haven't been implemented yet—they are lower priorities because these pages are less frequently used.

- The item edit page is very long and undifferentiated visually, so finding the place where you need to make changes can be difficult.
- Successive changes to a single item are difficult, since upon completion of a change there is typically a) no confirmation/save step and b) upon completion of the change the administrator is usually taken to a top-level page that only provides for access to items via either handle or internal item ID.
- Need to provide all sidebar options on each page—the change from the anonymous/depositor options to administrator option leaves no clear path back to e.g. the home page.
- Administrators need the ability to add files to items in their collection. Not remove—we reserve that for higher level Deep Blue administrators so we can protect the integrity of the system, and its archival function, as a whole.
- During edit metadata step, need a “exit and save changes” and “exit, don't save changes” option.
- During edit step, need a verification that a save happened.
- On the edit item metadata page, it would be best to provide real (and collection specific) labels for metadata; not DC values. This will probably be difficult.

Conclusion and Thanks

Overall, the interface and our modifications to it tested quite well; there were no show-stopping problems or issues, and all users were able to complete all tasks. So our main goal for the coming months is to smooth out some of the rough edges and enhance existing functionality.

Finally, thanks: Our library usability group provided feedback and support on the first and second round of testing. I can share the scenarios we developed for those rounds with any who ask. While I can't share the specifics of what the School of Information class did, their thorough review of Deep Blue added depth to our own findings, and pointed out more areas for improvement.

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