# Earth Sciences Metasearch Portal Usability Testing

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## INTRODUCTION

The California Digital Library's Metasearch Infrastructure Project is developing a prototype service that integrates NSDL into the foundational science collections managed by university libraries. The prototype includes tools that enable libraries to create views of their integrated science collections customized to the needs of different patrons. In support of this goal, the CDL is working to create metasearch tools and software that campus libraries can use to craft search portals tailored to specific audiences. The primary goal of the metasearch service is to assist users in efficient discovery of information across a range of resources.

For more information about the project, please see <a href="http://www.cdlib.org/inside/projects/metasearch/NSDL/">http://www.cdlib.org/inside/projects/metasearch/NSDL/</a>.

This document outlines the findings from a round of usability testing of the Earth Sciences Metasearch Portal prototype.

## METHODOLOGY

This round of usability testing consisted of seven task-based user interface testing sessions. Each session included one participant, a facilitator, and an observer/note-taker. Before the taskbased portion of the assessment, the facilitator asked participants about their general research habits and experiences.

The key questions addressed include the following:

- 1. Do users understand the purpose of the site?
- 2. Does the site navigation make sense to users?
- 3. Do users view NSDL content as useful?

## TASK-BASED USER INTERFACE TESTING

Each participant was greeted by the facilitator and made to feel as comfortable as possible. The facilitator explained the purpose of the test. Participants were assured that the system was being tested, not them. The facilitator summarized test procedures and instructed participants on the "thinking aloud" protocol. At the end of the introduction, the facilitator told the participants about their right to stop testing at any time, asked them to sign consent forms, and presented them with a \$25 gift card for the campus bookstore.

During the session, participants were asked to complete a series of tasks to the best of their ability. At the end of the session, the facilitator debriefed participants about their experience and thanked them for their efforts.

During task-based user tests, the following data were collected using observation and the "thinking aloud" protocol:

- Steps taken by the participant to complete each task
- Indications of frustration or satisfaction from the participant
- Opinions of usability and aesthetics of the system expressed by the participants

## **ASSESSMENT FINDINGS**

## SEARCH

"It seems really basic... not very advanced in terms of searching toolbar."

## Figure 1: FindIt Homepage

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#### 1. Search box

- Because button is "FindIt" and header is constant, assumed that search would be performed in general find it.
- Search box could be searching keyword, title, author.... it doesn't say.

#### 2. Labeling: Search button

- Clicked "Findlt" search button thinking it would lead back to homepage. System reruns previous search
- Reserve logo for homepage button

#### 3. Database grouping

- Likes core sources. It's pulling out things you'd want to use.
- Not sure what difference is between core and "also useful"
- Wonder why there are two categories of databases in search section

#### 4. Database links

- Blue links are perceived as other databases you can search.
- User can't tell if he's out of the system or in a different part of the system when he clicks database links.
- User thinks clicking on database links will take her to a more advanced search interface for that database.

## BROWSE

"If this is all that the website did, I wouldn't use this [browse] at all."

"Browse could be useful, but when I tried it, I didn't like it. I would get rid of it, because I wouldn't use it at all."



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#### 5. Missing UI element

• Need a link to homepage from this page.

#### 6. Search button

 User clicks search button on journals page expecting "a nice little search box" to come up. Didn't want to look at specific journal yet

#### 7. Browse journals / UC-eLinks search

- "I don't know what this does."
- UC-eLinks: "I have no idea how to use this."
- Pre-selection lost if any action taken

#### 8. Numbers

- Not sure what numbers in subcategories mean
- Wants number of sources (articles) listed for each database

#### **Expectations for Browse Section**

The facilitator asked participants what they would expect if they clicked on items in the "Browse Journals" section. Participants responded with the following statements:

• "I'm guessing that it'll take you to a page that gave you more recent, hand selected articles... 10-15 with the ability to search... maybe a range of general topics, general journals."

- "So if I'm not exactly sure what I'm looking for, I can start general and go down."
- Clicking on "Geography" link would bring up articles or journals on geography
- "It would be nice to be able to search after clicking on a topic."
- Experience has been that user clicks on a topic and then has the ability to enter search for keywords within that subject area.

## SEARCH RESULTS

"The number of articles found is intimidating, but with a general search, that's going to happen."

"It just picked up everything that had earthquakes and tsunamis in it. It didn't let you limit it by keywords or title or author."

"This is a pretty bad way to start if I'm doing a general paper on earthquakes and tsunamis.... way too specific." [Participant referring to the advanced nature of search results.]

"For a start, if I didn't know about water on mars, a lot of these might be intimidating.... there are a lot of intense words."

Users want to know how relevance is determined.

#### Figure 3: Wait screen



#### 9. Feedback element: Numbers

- "I don't know how they get 70 out of this huge number."
- Changing numbers during wait period: showing the different numbers of results by database
- Users like getting numerical feedback about number of articles found

- "If it was any more than 30 seconds, I'd think there was something wrong with it. That's why the numbers are good."
- Numbers "tell that there's a very large database that it's going through."
- Not sure if 60 articles has stuff from each source. Not sure which results are being displayed. Would like general articles to be displayed first so you can get a good idea of the topic
- Not really sure where the 60 articles come from. Thousands of articles indicated found.
- 1-10 through 60: "I guess it took the first 60 [most relevant articles]." Takes combined results, displays first 60 regardless of source database.
- Don't know why FindIt only gives you 50.

#### 10. Stop button

- User assumption: "often the most pertinent articles come up first anyway", so likes the ability to stop search and look at what's come back so far
- · Users appreciate ability to stop search once they feel like they have enough articles

#### 11. Labeling

• Change "Browse" to "View"

#### Figure 4: Results from a single source

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#### 12. Missing UI element: Back to results

- There should be a button on the single database results page to go back to the list of original results
- · Surprised that system has to rerun search in order to get original results list

#### Figure 5: Initial search results

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#### 13. More info link

 Thinks "more info" would give more information about the source of the article because of its placement

#### 14. Full text / UC-eLinks

- Likes that full text icon is right there.
- Confusing when link doesn't just go to the article
- Confusion/disappointment if full text link does not lead to full text.
- Would try to modify search to get a couple of full text articles rather than going to library.
- Knows that clicking UC-eLinks may lead her to full text, but scrolls down the list to find something with full text immediately available,
- Doesn't remember using UC-eLinks, maybe once last year.
- Takes him to UCLA. "Too complicated for me."
- Article had looked really promising, but couldn't get to it. Learned that "This UC-eLinks thing isn't necessarily going to guarantee anything for me."

#### 15. "Change Databases" link

• User clicked change databases. Got back to homepage. Surprised by this action.

#### 16. Other useful resources

- Other useful resources section: would think they would cover broad earth sciences resources.
- Didn't notice this section until facilitator pointed it out.
- Assumes this content does not react to search
- Saw "other useful resources" but ignored it

## News Feeds

"If it's a university, I trust that almost always.... NASA website, I trust that.... If it's just a person's website, I don't trust that."

"NSDL seems to be more basic and easy to understand and less scholarly."

#### Figure 6: Homepage

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Cartography	Geography	Meteorology		for 1,000 Years
Engineering Geology	Geology	Paleontology		• [more news]
Environmental Geology	Geophysics	Petrology		Image of the Day: Mount Merapi,
Extraterrestrial Geology	Hydrology	Stratigraphy		Indonesia
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#### 17. NASA feed

- "I wouldn't come to the subsite just for news," but it might be useful if you had news based on your search.
- "You wouldn't come to a journal search to find news."
- Maybe it's a starting point for people researching current things
- Probably wouldn't look at news section if she were searching for something. "Maybe if I was searching for ideas that would be nice.... Maybe it's a list of most popular articles chosen by librarians."
- "I do like this news thing on the side." After searching for articles for a long time, it's nice to see current news that may or may not be related.
- Least valuable section is news because "I've gotten to this page because I'm searching for specific articles. I probably wouldn't be searching for possible ideas for a topic."

#### 18. Image feed

 Image is interesting. "It was down at the bottom, so I probably wouldn't have noticed it offhand."

#### 19. Labeling

• Change title to "Latest news"

## NSDL FEED

"NSDL seems to be more basic and easy to understand and less scholarly."

"Seems really kid-friendly.... I feel like they're for junior high, elementary school teachers or kids."

"I feel like it's really basic and not up to par with what a university professor would expect." But it's good if you don't know anything about a topic.

"If I found one listing the basic facts or theories, I could find it useful.... It's nice that it has pictures. You might need one for your paper.... It's good to start off with depending on how little you know about your topic."

#### **20. Layout** (See Figure 3)

- Panel's size is big enough that you could consider it a feature of the website, but it's still skinny enough to be ignored.
- Because of the way websites are set up with ads, one user ignored this section completely, especially since it has a logo.
- Because of size and placement NSDL seems like additional resources. Google does advertisements relevant to searches on the side.

#### NSDL IN RELATION TO SEARCH RESULTS

"It's nice to have more basic items next to more scholarly ones."

The facilitator asked participants to comment on their search results and the adjacent NSDL content. The following statements represent the range of opinions the participants expressed.

#### A place to start

- Could be very useful for unfamiliar topics
- "Might be a good place to start."
- More drawn to using NSDL than search results
- "Seems like NSDL has been a lot more helpful."
- Seem to be on a very general level. Could be very useful for providing jumping off points. Doesn't think that it would provide research material in itself.
- NSDL useful for getting general information or background information. But would get research materials from search results.
- If she knew nothing about a topic, NSDL might be a good place to start. Once more detail is needed, then the results might be good.

#### A nice complement

- "It's nice to have more basic items next to more scholarly ones." A nice complement. They can work together.
- Benefit: can always find information in NSDL panel. "Appeals to a wide audience."
- NSDL: "things people can search on and produce better results"

- [One link] from University of Chicago "actually would be a good study guide."
- "I probably wouldn't look at this at first glance, but it is nice that it comes from a good source."

#### In contrast to search results

- "They're scientific articles so they're super technical." If she's just starting her research, then she just wants a general introduction to get an idea about the topic.
- Very scientific terms in search results. "Intended for scientists."
- Search results seem "more scholarly, more journal based". NSDL more "general public", more "website-based"
- Search results' titles are difficult to understand. If she can't understand title, then article probably is written in difficult language. You need to already know a lot about the topic
- Search results for people who are more knowledgeable about the subject. NSDL is basic.
- In search results, looks for shorter titles that have words she understands.
- "Probably these [NSDL items] are more general information... not technical publications"
- Search results are published in a journal: somebody's research.
- NSDL is more professional.

#### For a different audience

- NSDL could be useful for high school students
- NSDL is for somebody in a general education class looking for general information
- NSDL content not at sufficient level to write paper with

#### NSDL vs. GOOGLE: A RANGE OF RESPONSES

NSDL content would be better. "Google would be too general there.... If I wanted to see Google, I would just open up a new window and search Google."

The facilitator asked participants if they would prefer to replace the NSDL content with results from a search engine, such as Google. Participants responded as follows:

- NSDL seems like it would be more focused on science than Google. "On Google you can find anything."
- Don't know what NSDL is, but would figure it's more reliable than Google. "You can trust them more."
- NSDL results would be more helpful than Google, because Google would return nonscience stuff
- Would consider Google and NSDL results equivalent
- Thinks it would be interesting to include Google in list of databases searched. But, might be most appropriate/effective when doing a really specific search where other sources are getting zero hits.
- "If this were just Google or any random search engine, the results might be false information or random things that people put up." But this user would still want to see that.
  - There is a tradeoff between approved information at a basic level and general results the user could sift through to find something good.
  - o But can understand why you wouldn't want to have false information on this site.
  - o "It's a hard tradeoff, but I would want a regular search engine."

## CONCLUSION

- To users, FindIt is just another information silo where they can search for journal articles.
- Thus, users expect FindIt to behave like other databases and to have similar features and capabilities.

#### SEARCH

- "It just looks like a normal first interface for any search engine."
- Looks like a journal database or a way to search journals.
- Big plus that there's an earth sciences focus. Narrowed down for you.
- Title indicates it's for earth sciences. Some of page content is beyond, though.
- Thinks he might need to get out of Find It: Earth Sciences because question is about mars
- User wants checkboxes to choose which databases to search. Put checkboxes on every page.
- "I think Google Scholar is more limited." But it might be that article databases just give you more ways of finding things.
- Feels like PsycINFO gives you more options.

## ADVANCED SEARCH

- Use for known item search. "It's easier and faster."
- In most cases, search is general technical but not narrow.
- "Default system should be more general." But would like advanced search ability/link.
- Better to be simple than too complex.
- Advanced search is helpful
- Likes to search within results
- "I think it's very useful."
- Helpful to have keywords, author, subject, title, especially if you're looking for a specific article, something more particular.
- If she doesn't know what she wants to research then a general search is fine.
- "Much prefer the more advanced ones", especially those that allow NOT

## SEARCH RESULTS

- Doesn't seem like you can select different items. Wants ability to choose, e.g., 1, 3, 49 to compare them.
- Wants ability to sort results by relevance, date
- Would use abstract to see "generally where the paper was going." "I like a summary at the beginning."
- Likes hyperlinked article outline at the beginning of the article/page
- One big issue with PsycINFO: wants to be able to save across sessions. Can email selected articles to self but wants ability to return to previous lists.
- · PsycINFO has "almost perfect" citations. "That was really nice."
- Ability to save articles and email articles is helpful.

## WAIT TIME

- "Usually when I'm doing research, I'm trying to be more thorough than quick, so a few seconds doesn't matter."
- "It's kind of slow."
- Would get impatient and press stop after 10-15 seconds for a general search. For a specific search, would wait as long as it took. For general search, probably not that worthwhile to wait that long.
- Willing to wait up to one minute. Likes being able to view first returned results as the rest come in. Recognizes that there is a buffer. Has to wait until text becomes hyperlinked.

## **APPENDICES**

#### **APPENDIX A: QUESTIONS AND OBJECTIVES**

1. After getting a research or paper assignment, how do you get started? What are your strategies for finding information?

Objective: Determine research habits.

2. What kinds of difficulties do you run into in the course of doing research for an assignment?

Objective: Determine "points of pain."

3. Please describe what you are seeing and what your impressions are of this site.

*Objective: Determine user's first impressions of site, what stands out for him/her.* 

4. You have been assigned to write a paper about earthquakes and tsunamis. Look for a few articles that may help you narrow down your topic.

Objective: Determine whether or not user is able to perform a search.

a. Next, examine the list of articles from INSPEC only. Look at the full text of an interesting article from this list.

Objective: Determine whether or not user is able to navigate among databases.

b. Now look at the list of articles from GeoRef. What are your impressions of this list? Please describe what you are seeing.

*Objective: Determine user's impressions of results list, including inclusion of full text icons.* 

5. Your next assignment is to write about scientists' quest to find water on Mars. Find a few resources that will help you get started.

*Objective: Determine whether or not user is able to navigate back to homepage and perform a new search.* 

a. [Do your search results appear in a way that is helpful to you?]

Objective: Determine whether or not user is satisfied with the contents and display of results list.

b. [What do these numbers mean to you? Do they make sense?]

*Objective: Determine how the user interprets and reconciles the different numbers on the interface.* 

6. Please rate the usefulness of each section.

Objective: Determine user's perceptions of each of the sections.

## APPENDIX B: SCHEDULE AND PARTICIPANT DEMOGRAPHICS

This round of testing took place May 23 – 24, 2006 at UCLA.

## Tuesday, May 23, 2006

9:30 – 10:30AM	First-year Undergraduate Student, Psychology and Biology
10:45 – 11:45AM	Graduate Student, Electrical Engineering
1:00 – 2:00PM	First-year Undergraduate Student, English
2:15 – 3:15PM	Third-year Undergraduate Student, Psychology
3:30 – 4:30PM	Fourth-year Undergraduate Student, Psychology and History

## Wednesday, May 24, 2006

9:00 – 10:00AM	Fourth-year Undergraduate Student, Chemical Engineering
10:15 – 11:15AM	Fourth-year Undergraduate Student, Chemical Engineering