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UX Report: DataONE Public Site Test Report: Phase II – Faculty, Staff, and Graduate Students

UAWG
University of Tennessee, Knoxville

DataONE Public Site Test Report

Phase II – Faculty, Staff, and Graduate Students

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Executive Summary

The Usability and Assessment Working Group conducted usability testing for DataONE public website (www.dataone.org) at University of Tennessee Knoxville from June 7th to June 20th, 2011. The usability testing was conducted at a place convenient for participants, and a laptop with installed Morae software was carried to the place to conduct the testing. This is the Phase II of DataONE website usability testing, with faculty members, staff (e.g., data mangers), and graduate students from environmental sciences and related disciplines as participants. Some menu items on the DataONE site have been changed after the completion of Phase I (March 22nd – April 4th)[1], so three tasks in Phase II have been revised accordingly.

A total of 22 participants joined the Phase II test. One faculty participant did not start the recording properly, so his/her recording was not usable. The following report only focused on the 21 participants. Among 21 participants, eleven were faculty members, with five staff members and five graduate students. The session time in the lab lasted approximately from 11 to 39 minutes.

In general, most participants found the DataONE site easy to navigate. The test identified some problems in the interface including:

- Confusion about what they expected to find under tabs "News and Events," "Events Calendar," and "Training Events."
- Search box only on the homepage
- Unconstructive warning message from search system feedback
- Too much information on certain pages
- Text, maps, and images hard to read

This document summarizes participants' interactions with the DataONE site when searching for relevant information as well as their subjective ratings. A copy of the scenarios and questionnaires are included as Attachments.

Methodology

Session Overview

Every session was conducted at the participant's office or a place convenient to the participant (e.g., a computer lab). Each individual session lasted approximately from 11 to 39 minutes. During the session, participants first filled out a pre-task questionnaire regarding their familiarity with the DataONE project. Then participants read three test scenarios and were required to accomplish several search tasks associated with each scenario. Participants were also required to vocalize their thoughts during the process. Upon finishing the test, participants filled out a post-task questionnaire regarding their evaluation of DataONE site.

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[1] Participants in Phase I included undergraduate students only.

Pre-Task Questionnaire

Before introducing the search tasks, the test administrator asked the participant to answer six questions regarding their familiarity with the DataONE project by using a 7-point Likert scale (Disagree Strongly to Agree Strongly) (See Attachment A).

Search Tasks

A total of three scenarios were provided for participants. Each scenario focused on one particular information section on the DataONE website. (see Attachment B for complete test scenarios):
- Scenario one (three search tasks): focusing on basic information about DataONE project
- Scenario two (three search tasks): focusing on information about data management plans, best practices, and training event
- Scenario three (two search tasks): focusing on information about software tools

Post-Task Questionnaire

After the search tasks were completed, the test administrator asked the participant to evaluate the usability of the DataONE site using a 7-point Likert scale (Disagree Strongly to Agree Strongly) for 15 subjective measures. (See Attachment C.) Examples included:
- Features of the site
- Perceived complexity of the system
- Ease of use
- Information presentation
- Information access

At the end of the survey, the participants could write down their thoughts in one open-ended question.

Results

This section will report results in three parts: pre-task questionnaire, search tasks performance, and post-task questionnaire.

1. **Pre-Task Questionnaire**

Overall, almost one-third of the participants had heard of the DataONE project, but most of participants were unfamiliar with the project and had not visited the site before. None of participants were directly affiliated with the project, but three participants indicated that someone they know affiliated with the project. In addition, approximately one-third of participants agreed that DataONE was applicable to their work. The "neutral" response possibly indicates "unsure" or "do not know" (Table 1).

Results in pre-task questionnaire in Phase II are quite different from those in Phase I. Most of the undergraduate participants in Phase I had not heard of DataONE or did not think the project was applicable to their work. The differences indicate the choice of participants--faculty, staff, and graduate students in earth and environmental sciences are more interested in the DataONE project and feel it is relevant for their research and academic life.

Table 1. Summary of Participants' Familiarity with DataONE Project[2]

	Disagree[a]	Neutral	Agree[b]	Mean Rating[c]	Percent Agree
I have heard of DataONE	14	1	6	3.10	29%
I am familiar with DataONE	19	1	1	2.05	5%
DataONE is applicable to my work	6	9	6	3.90	29%
I have visited DataONE's website	20	0	1	1.52	5%
I am directly affiliated with the DataONE project	21	0	0	1.00	0%
Someone I know is directly affiliated with the DataONE project	16	2	3	2.14	14%

[a]Disagree: combined answers from "disagree strongly," "disagree," and "disagree slightly."
[b]Agree: combined answers from "agree strongly," "agree," and "agree slightly."
[c]Mean Rating: mean values by averaging answers on the 7-point Likert scale.

2. Search Tasks

Participants were required to search information on the DataONE site for eight tasks in three scenarios. Table 2 below provides a brief description of the eight tasks. Appendix B provides the detailed descriptions of the scenarios and tasks.

Table 2. Task Descriptions

		Descriptions
Scenario 1: DataONE basic info	**Task 1**	What is DataONE project?
	Task 2	Who are DataONE current partners in California?
	Task 3	Give two events on July 18th.
Scenario 2: best practices, data management plan, and training event	**Task 4**	List three "documenting data" practices under "Best Practices"
	Task 5	What is data management plan?
	Task 6	What is the training event on August 8th?
Scenario 3: tools info	**Task 7**	Give two example tools for scientific workflow
	Task 8	What is the technical expertise requirement for ArcGIS Desktop tool?

[2] All questions use 7-point Likert scale: strongly disagree (1) to strongly agree (7).

a. Time on task and Success rate

Task performance was measured by two factors: time on task and success rate. Table 3 below provides the mean values for the two measures.

Table 3. Task Performance

		Time on Task[a]	Success Rate[b]
Scenario 1: DataONE basic info	**Task 1**	2.94	1.0
	Task 2	2.67	1.0
	Task 3	2.21	0.67
Scenario 2: best practices, data management plan, and training event	**Task 4**	2.32	0.90
	Task 5	1.08	0.76
	Task 6	0.98	0.86
Scenario 3: tools info	**Task 7**	2.08	0.95
	Task 8	1.54	0.81

[a]Time on task: measured in minutes
[b]Success rate: calculated by (# of participants successfully accomplished the task) / (# of participants)

The average time spent on all three scenarios was 15.82 minutes (SD = 5.46, min = 6.73, max = 26.38). Based on "time on task" and "success rate", task performance of eight tasks is reported individually as following:

- All tasks in scenario 1 generally required more than 2 minutes to locate the information. All participants accomplished task 1 and task 2 successfully, whereas the success rate for task 3 was low.
- Task 4 in scenario 2 required more time but had a high success rate, whereas task 5 required less time but had a low success rate. Task 6 regarding training event needed less than 1 minute and had a high success rate, indicating that training information is easy and fast to locate.
- Task 7 and task 8 in scenario 3 required approximately 2 minutes but both had high success rates. Thus, participants could locate information about tools on the site as long as they spent more time in looking for it.

b. Interactions and thoughts about the website to locate the information

MORAE software was used to record both participants' interaction with the website (how they located the information) and their think-aloud data (thoughts about finding the information). Results from MORAE recordings are reported below.

- For the meaning of DataONE, participants began in either "about DataONE" page or "DataONE Organization" page. The observations showed that most participants stayed on the "about" page for a long time, indicating they might read the texts to find the answer. Reading the condensed texts may be the reason this task required more time (compared to other tasks) to locate the relevant information.

- One faculty participant commented that "this page has a lot of text, so it is sort of hard to find a list of things."
- Task 2 required participants to find the DataONE current partner that is located in California. More than half of the participants directly went to "Partners" page and found the information; six participants went to "DataONE Users' Group" and then turned to "Partners"; one participant used "Search" box at home page. Generally, although participants went to different places to search information, this task has a high success rate.
  - One faculty participant who chose "DataONE Users' Group" commented that "I think it [users' group page] tells me something about California partners. It does not seem easy to find." S/He also found a spelling error on "partners" page – Santa Barbara, not Santa Barbra.
  - Several participants also commented about the image and the map on the "partners" page. One faculty mentioned that "my eyes were drawn to the graph [the image on the top] with a lot of arrows. It is a little bit confusing." Later the same participant commented that "there are some [places] in the map but not in the texts. It's not clear." Another staff said "by looking at the map, I'm still not sure if University of California Santa Barbara is coordinating node or member node." Those comments indicated a reading problem with the map and map presentation.
- Task 3 required participants to report two events scheduled on July 18th. The correct information was located under "Events Calendar." However, ten participants checked "News and Events" first. Because these participants spent lots of time on "News and Events" page to read through the news in order to find the answer, task time value was large. In addition, among those who read through "News and Events" page, six of them failed the task, which leads the low task rate.
  - One participant suggested that the "News and Events" page may be organized by dates.
  - Three participants mentioned the confusion between "News and Events" and "Events Calendar."
- Task 4 asked for information about "Best Practices." Most participants located the correct page through browsing the menu bar on top of each page; some used search box on homepage to locate the information. This task required some time but it had high success rate, indicating the menu bar was useful in assisting participants locating the information.
- Similar to the actions taken in task 4, participants who completed task 5 successfully located the correct page through browsing the menu bar directly. Three participants chose to search, but none of them found the information through results returned by search engine.
  - One participant used the search box on the homepage. The search query was "data one project data management plan."
  - Two participants used the search box on the page of "best practices." The default option in the search box on this page is to limit search results within "best practices" pages, by adding query "type:best_practice" after users' input query. The two participants did not realize that the returned results were a constrained set of results, so they could not find needed information. This observation indicates that the system needs to tell users if it adds constraints to the search

query or the default option for the search engine should be searching the whole site without any constraints.

- Task 6 required information about training events on a particular date. Most participants located the right page for the information directly through the top menu bar, which included an entry titled "Training Events." However, five participants went to either "News and Events" or "Events Calendar" or both pages for information. Although "Events Calendar" provided the training event name in an acronym on the required date, clicking "details" link did not tell any specific information about this event, which made a few participants confused as to whether the event was the training event.
    - Four participants identified possible problems on "Events Calendar" and "Training Events." One faculty suggested that "it is better if these two calendars can somehow link to each other." Three graduate students thought the information about training events should also be explained in "Events Calendar."
- Task 7 asked participants to list two example tools under one particular category. The information was located on the "Software Tools" page. Most participants directly entered this page from the top menu bar; some used the search box to find the relevant information. Generally, this task required less time and had a high success rate.
- Task 8 asked for particular information about a specific tool. Nine participants located the information through browsing pages; eight used the search function either on the home page or on the "Software Tools" search box. Among those who failed the task, two got lost in browsing different pages and two failed in searching the information. For example, one faculty participant (F1) read "Resources" page, then moved to "Software Tools" page and chose different links insides this page to look for "ArcGIS Desktop" tool, but h/she did not find it. Generally, it took less time to find the information and the task had a high success rate.

In addition to the analysis on each task, three possible usability problems were identified through the overall observations on the whole process.

- The Search box appears only on the home page, "Best Practices" page, and "Software Tools" page. Confusingly, the two search boxes on "Best Practices" and "Software Tools" page provide constrained search results without notifying users. In addition, the search engine feedback is not user-friendly. One faculty participant (F9) commented that he did not understand when the search system gave a warning message saying "invalid argument" and he did not know how to revise the query based on the feedback.
(F9 searched the query "data one project partners in California." The system returned results with red texts on top saying "warning: Invalid argument supplied for foreach() in /var/www/modules/taxonomy/taxonomy.module on line 1226.)

- A data manager participant mentioned several times during the whole process regarding the font size on the website. He commented that "the font size is too small. It is difficult for me to read, like me, older people." The website can provide zoom-in and zoom-out icons on each page so people can choose to magnify or shrink the font size for easy reading.

- At the home page, the "Resources" tab on the top menu bar includes four entries: Data Management Plans, Best Practices, Software Tools, and Training Events. However, on the right lower part of home page, under "Learn", the page still displays "Learn Homepage," "Data Management Plans," "DataONEpedia," and "Training Events," which is inconsistent with those shown on top menu bar.

Overall, most participants finished all eight tasks within the required time. One common pattern across all participants was consistently using "Home" tab to back to home page when beginning a new task. The availability of "Home" tab in every page seemed to be convenient and useful for users. In addition, most participants showed confusion for the tabs "News and Events," "Events Calendar," and "Training Events." Participants expected to find events information under "News and Events" but could not locate relevant information.

Participants also spent a lot of time on certain pages that included condensed texts to locate relevant information (e.g., Task 1). When pages include bolded texts and distinctive text chunks, it was easy and fast for participants to find the relevant information (e.g., Task 6 and Task 8).

3. Post-Task Questionnaire

After task session completion, participants rated the site for a total of 15 subjective measures and provided any comments they had in one open-ended question (See Attachment C).

a. Subjective measures

See Table 4 below.

Table 4. Post-Task Questionnaire[3]

#	Questions	Disagree[a]	Neutral	Agree[b]	Mean Rating[c]	Percent Agree*
1	This site was missing critical features that would be very useful to me	8	3	8	3.84	42%
2	This site was exactly what I needed to carry out my tasks	6	2	13	4.68	68%
3	It was difficult to complete my tasks effectively because some of the features I needed were not available	11	3	5	3.11	26%
4	This site contains appropriate features for my purposes	4	1	14	5.11	74%
5	It was easy to locate information on this site	3	5	11	5.47	58%
6	I could get to information quickly and easily	3	0	16	5.32	84%
7	It was easy to access information that I needed	3	1	15	5.37	79%

[3] All questions use 7-point Likert scale: strongly disagree (1) to strongly agree (7).

#	Questions	Disagree[a]	Neutral	Agree[b]	Mean Rating[c]	Percent Agree*
8	The overall purpose of this site was easy to determine	4	1	14	5.00	74%
9	I needed help accessing and understanding this site	13	2	4	2.58	21%
10	It is easy for me to learn how to use this site	2	3	14	5.58	74%
11	This site that give me access to information that I need are convenient and easy to use	3	2	14	5.37	74%
12	The information that I needed was displayed in an understandable layout	4	0	15	5.11	79%
13	The information was presented in a useful and understandable format	3	2	14	5.47	74%
14	There was so much information, it was difficult to sort through it	11	1	7	3.47	37%
15	The information was located in so many different places; it was hard to know how to use this site effectively	13	1	5	3.05	26%

[a]Disagree: combined answers from "disagree strongly," "disagree," and "disagree slightly."
[b]Agree: combined answers from "agree strongly," "agree," and "agree slightly."
[c]Mean Rating: mean values by averaging answers on the 7-point Likert scale.

The 15 questions can be grouped into several categories regarding different aspects of usability issues of the site.

- Feature availability (Q1, Q2, Q3, and Q4): most participants agreed that the site included necessary features for task completion
- Locate and access to information (Q5, Q6, Q7, and Q15): approximately two-thirds of participants agreed that was easy to access information. Among these four questions, Q5 received the lowest percentage of participants who agreed (58%) agreed that it was easy to locate the information.
- Understanding the site (Q8): most participants showed understanding of the site
- Learn or help needed for the site use (Q9 and Q10): almost one-third of participants thought the site was easy to use and did not need any help.
- Information on the site (Q11, Q12, Q13, and Q14): approximately two-thirds of participants agreed that information was easy to use, and that the information layout and presentation were understandable.

b. Open-ended question

Eleven participants provided comments in the open-ended question. Overall, participants thought that drop down menu on the top worked well and the whole site was easy to navigate. Participants also mentioned several problematic areas:

- On "Partners" page, the names shown on the map did not match the names shown on the text list next to the map.
- The tab "News and Events" was really about "News" only
- Search box should be in every page. One participant commented that users "shouldn't have to search to find a search box."

- Some pages required more time to read and understand. One participant commented that "[the site is] easy to use to complete tasks, [but I] would have to spend more time with the site to understand full capabilities and how it would relate to my research."

Conclusion

Most of the participants found the DataONE site easy to use. Some recommendations are given to improve user experience. Continuing to work with users (i.e., lay persons, older people) will ensure a user-centered website. Good features included a top menu bar and a home tab on every page as an easy exit strategy.

Recommendations
- Tab "News and Events" may need to change to "News", because the contents on this page only include news of DataONE. Having "News and Events" confused users about its difference from other two tabs "Event Calendar" and "Training Events"
- The contents on "Events Calendar" should include specific information when users click "Details" link. The contents also need to be linked with the training events provided under the tab "Training Events."
- The search box should be available on each page, not just on the home page. The warning message should give constructive feedback to help users reformulate their queries.
- Text, maps, and images on the site should include "enlarge" function to make it easy for users to read, in particular those with vision problems.
- Bullet points, bolded texts, or links in some pages that have condensed texts should be added. The changes will make it easier for users to read and capture the important points on the page.
- The link name "DataONEpedia" on the homepage needs to change to be consistent with the entries on the top menu bar.
- Correct the spelling error of Santa Barbara on "Partners" page. Need proofreading for all pages on the site.

Appendix A – Pre-Task Questionnaire

Here are a number of characteristics that may or may not apply to you. **Circle a number from 1 to 7** to answer your responses to **ALL** of the following questions for each of the listed activities. *Please take your time and read the instructions completely.* The numbers are used in this way:

Disagree Strongly	Disagree	Disagree Slightly	Neutral	Agree Slightly	Agree	Agree Strongly
1	2	3	4	5	6	7

1. I have heard of DataONE. $1 - 2 - 3 - 4 - 5 - 6 - 7$

2. I am familiar with DataONE. $1 - 2 - 3 - 4 - 5 - 6 - 7$

3. DataONE is applicable to my work. $1 - 2 - 3 - 4 - 5 - 6 - 7$

4. I have visited DataONE's website. $1 - 2 - 3 - 4 - 5 - 6 - 7$

5. I am directly affiliated with the DataONE project. $1 - 2 - 3 - 4 - 5 - 6 - 7$

6. Someone I know is directly affiliated with the DataONE project. $1 - 2 - 3 - 4 - 5 - 6 - 7$

Appendix B –Task Scenarios

We would like you to find information on a science project website. We will provide you some imaginary scenarios for the tasks. There is no right or wrong answers to each question. Try your best to find the answers. If not, just leave it blank.

Please say out loud what you are thinking about when searching for the information. When you are ready to begin, click the red "start" button.

Scenario 1: You're working on a research project that requires large datasets. You've heard that the DataONE initiative could be useful to your project and you've been directed to the website. Find the answers to the following questions on the DataONE website and record them on the paper provided.
1. What is the DataONE project?
2. Who are the DataONE current partners in California?
3. What are the two events on July 18th?

Scenario 2: Since your project requires large datasets, you want to know the best way to manage them. Find the answers to the following questions on the DataONE website and record them on the paper provided.
1. Give three example practices in "documenting data" provided in "Best Practices."
2. What is a data management plan?
3. What is the training event on August 8th?

Scenario 3: DataONE provides tools to help you manage large datasets. Find the answers to the following questions on the DataONE website and record them on the paper provided.
1. Give two example tools used for "scientific workflows" in "Software Tools."
2. What is the technical expertise requirement for ArcGIS Desktop tool?

DataONE

Appendix C – Post-Task Questionnaire

Here are a number of characteristics that may or may not apply to you. **Circle a number from 1 to 7** to answer your responses to **ALL** of the following questions for each of the listed activities. *Please take your time and read the instructions completely.* The numbers are used in this way:

Disagree Strongly	Disagree	Disagree Slightly	Neutral	Agree Slightly	Agree	Agree Strongly
1	2	3	4	5	6	7

1.	This site was missing critical features that would be very useful to me.	1 – 2 – 3 – 4 – 5 – 6 – 7
2.	This site was exactly what I needed to carry out my tasks	
3.	It was difficult to complete my tasks effectively because some of the features I needed were not available.	1 – 2 – 3 – 4 – 5 – 6 – 7
4.	This site contains appropriate features for my purposes.	1 – 2 – 3 – 4 – 5 – 6 – 7
5.	It was easy to locate information in this site.	1 – 2 – 3 – 4 – 5 – 6 – 7
6.	I could get to information quickly and easily.	1 – 2 – 3 – 4 – 5 – 6 – 7
7.	It was easy to access information that I needed.	1 – 2 – 3 – 4 – 5 – 6 – 7
8.	The exact purpose of this site was easy to determine.	1 – 2 – 3 – 4 – 5 – 6 – 7
9.	I needed help accessing and understanding this site.	1 – 2 – 3 – 4 – 5 – 6 – 7
10.	It is easy for me to learn how to use this site.	1 – 2 – 3 – 4 – 5 – 6 – 7
11.	This site gives me access to information that I need are convenient and easy to use.	1 – 2 – 3 – 4 – 5 – 6 – 7
12.	The information that I needed was displayed in an understandable layout.	1 – 2 – 3 – 4 – 5 – 6 – 7
13.	The information was presented in a useful and understandable format.	1 – 2 – 3 – 4 – 5 – 6 – 7
14.	There was so much information, it was difficult to sort through it.	1 – 2 – 3 – 4 – 5 – 6 – 7
15.	The information was located in so many different places; it was hard to know how to use this site effectively.	1 – 2 – 3 – 4 – 5 – 6 – 7

Any other comments:

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