
engage: University of Michigan Clinical Research

Team Envolve (Pratibha Bhaskaran, Liz Blankenship, Tammy Greene)
SI 622 • Assignment 5 • February 14, 2008

Introduction

Overview & Functionality

Engage is the central resource for people who would like to participate in clinical research at the University of Michigan. Potential participants use the site to learn more about clinical research, find studies, as well as register as a participant of a study.

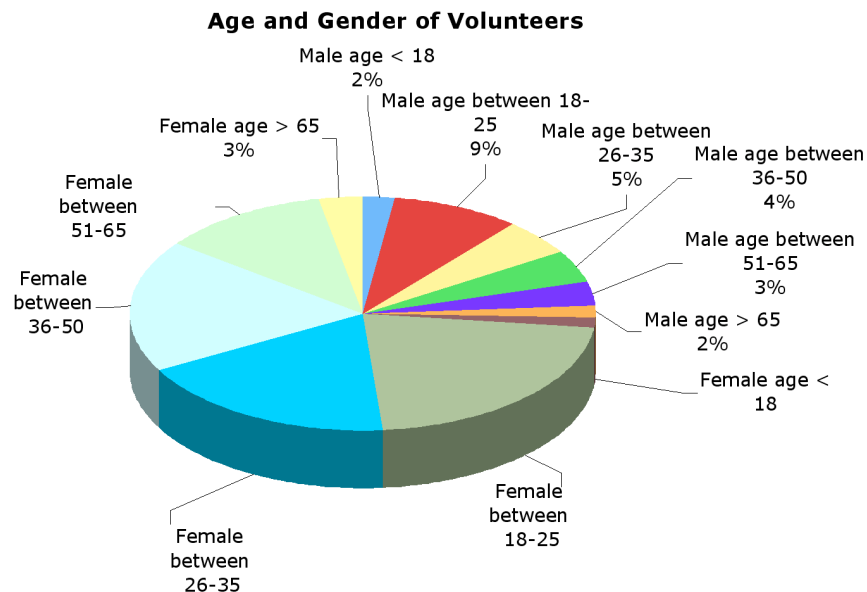
Other than static general informational pages, the site has several features such as a study database, public search tool and a secure registry. The Engage database houses each study that is listed online and can be searched using a variety of search queries. The registry is a feature that allows interested volunteers to enroll in a registry as well as be matched to potential studies so that researchers can contact them as a potential candidate.

Target Users

The target users for the Engage site are potential participants in the University of Michigan community. Results from recent user data show that currently women within a wide range of ages largely dominate (75%) the participant user base with the largest percentage being between the 18 to 25 age range (21%). The 26 to 35 and 36 to 50 age ranges, both 18%, follow a close second and third portion of the user base. Another large demographic of the participant user base is UM employees. Most (56%) of the current users fall into this category.

Though these are typical users, Engage would like to strengthen its use among minorities, which is a very small part (20%) of its user base. Currently, most of the users are white or Caucasian (80%).

engage: U-M Clinical Research



The Engage user base is largely female. Users also tend to be Caucasian and employees of U of M.

Goals

The purpose of this report is to present the findings from the heuristic evaluations conducted by each of the members of our team. Heuristic evaluation is used to identify major usability problem areas of a system based on heuristic assessments. The goal of our evaluation was to identify these problem areas, rate their severity and recommend solutions. We will use the findings from these heuristic evaluations to help guide our focus for our upcoming usability studies and recommendations.

Methods

Heuristic evaluation is a way to identify common problems by using a set of usability guidelines, or heuristics, to help identify problems in a system. To evaluate Engage, we used a set of ten heuristics that were defined by Jakob Nielsen as a result of a factor analysis of 249 usability problems (Nielsen 1994b) (Nielsen 1994a).

The 10 heuristics are: (Note: For an explanation of each of the heuristics, see the appendix.)

1. Visibility of system status
2. Match between system and the real world
3. User control and freedom
4. Consistency and standards
5. Error prevention
6. Recognition rather than recall
7. Flexibility and efficiency of use
8. Aesthetic and minimalist design
9. Help users recognize, diagnose, and recover from errors
10. Help and documentation

engage: U-M Clinical Research

Each issue identified is also given a severity rating on a scale from 0 to 4, as follows:

Severity rating	Explanation
0	I don't agree that this is a usability problem at all
1	Cosmetic problem only: need not be fixed unless extra time is available on project
2	Minor usability problem: fixing this should be given low priority
3	Major usability problem: important to fix, so should be given high priority
4	Usability catastrophe: imperative to fix this before product can be released

We worked independently to identify problems using the heuristics as a guideline because "there is a substantial amount of nonoverlap between the sets of usability problems found by different evaluators" (Nielsen 1994b). This helped us to identify more problems than we would have had we collaboratively listed the issues. Then we combined our findings into the following report.

Findings

We were successful in identifying a number of usability issues in Engage using the heuristics set. We have broken these findings up into three sections, corresponding to different portions of the Engage site which are generally used to accomplish different goals, as we have done in the past for our Generalized Transition Network and Comparative Analysis.

These three sections are:

- Pages with general information about clinical research
- The search portion of the site that allows you to find information about studies
- The Engage registry, used to match users to potential studies by allowing users to organize their studies or list themselves as available for contact by research staff

For each of these three parts of the site, we have generated a table of the issues we encountered, including the severity of the problem and the heuristics violated by the issue. We also include a summary for each section that emphasizes the main problems identified.

engage: U-M Clinical Research

Findings for General Information About Research on Engage

Issue	Severity	Heuristics Violated
Many of the pages on Engage are rich with unnecessary text. For example, the homepage includes a lengthy introduction to the site with inline links to get you started. There are no clear indicators of where to start without reading through much of the text.	3	8
The <i>Questions/Answers</i> section is a long uncategorized list that has general questions about clinical research regardless of where on the site you are. The user has to skim all questions even if they have a question in a particular category.	1	3,10
The <i>About Research</i> part is chunked into sections, but is visually monotonous due to a text-only approach.	2	8
Several links such as 'multicultural research participation' are provided as inline text links rather than in a navigation panel or a more prominent display. They are however present prominently on the home page. Others are repeated as both inline text links as well as in the navigational panel.	3	8
Several links outside of the Engage site are no longer functional and link to error pages such as the UM staff link and the Additional Resources link.	2	8

The problem that most frequently impedes the ability to find general information on the Engage website involves the visual display and its aesthetics. In general, the Engage website is in a league of its own compared to sites that have similar purposes and offer similar functionality because it provides more comprehensive search and registry features. But the aesthetic elements on the site currently diminish the value of the site by preventing the visibility of the most relevant elements for the users on the site.

From Jakob Nielsen's heuristics we know that "dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialog competes with the relevant units of information and diminishes their relative visibility" (Nielsen 1994b). The most severe problem areas identified within this section deal mostly with Engage's overwhelming amount of information and navigation options that is often confusing and a hindrance for the user.

engage: U-M Clinical Research



The Engage homepage - an example of one of the many text-heavy pages on the site.

elements of the site to diminish.

A solution to these problems is one that finds balance between the aesthetic principles of design and the functionality of the site. The design and layout of the navigation systems should be restructured to use the least but most effective amount of space keeping in mind the goal for accessibility. The contextual systems should complement the global system, which appears on every page, and the local system, which is specific to an area of the site. The most critical elements should be used in the global navigation and everything else should be dispersed within the local and contextual systems. Specifically, the irrelevant contextual links in the paragraph texts should be removed and critical elements such as links to the Enrollment page, Find Studies page and Question and Answer page should be included in the global navigation as they are now. If there are more important links, they should also stand prominently on the page. An alternative solution would be to restructure the global navigation based on audience rather than task so that the navigation is relevant to the audience.

The Engage homepage is bombarded with text. Most often this text is used as a method to incorporate contextual navigational systems embedded within the content of the site. This is an additional type of navigation system used to provide associative learning for the users as they explore the site. When used in moderation, these systems can provide flexibility for the user, especially when navigating a new site. But when used in excess, these contextual navigation systems can be confusing and add clutter to an otherwise clean visual design (Rosenfield and Morville, 1998). On the Engage site, the contextual navigation repeats links that are in the major navigation and short-cut sub-navigation on the right side of the screen. With all the clutter that is added, the content and navigation violate Nielsen's Aesthetic and Minimalist Design principle and cause the prominence of the most important

engage: U-M Clinical Research

Findings for Using Search on the Engage Website

Issue	Severity	Heuristics Violated
The left navigation on the help page for finding studies includes links <i>Volunteer Feedback Form</i> and <i>Post or Edit Study</i> ; each is meant for a different audience and is unnecessary for the other.	2	7, 8
Clicking <i>Start Search</i> on the <i>Find Studies</i> page leads you to a compulsory quick survey.	4	3, 7
The <i>Find Studies</i> link in the navigation leads you to a page where you choose between starting your search and going to a help page about searching - an unnecessary step. (Help could be accessible from the search page.)	3	7, 8
Language used in the description of studies often includes medical terms, which do not appear in the glossary.	3	2
The <i>Find Studies</i> page's navigation does not contain all the same links as <i>I need help searching</i> , the left navigation has the extra links <i>Volunteer Feedback Form</i> , <i>Help/Contact us</i> and <i>Search Studies</i> .	2	4
While on a study description page, there is no indication of which section the user is in. On the main section pages, however, the relevant tab is highlighted.	2	1, 4
Help documentation is excessive on the <i>I need help searching</i> page.	1	10
No help is accessible after you click through the screen before your search.	3	10
The help page loads in the current screen which does not allow the user to look at both while completing a task.	2	6, 10
When searching through studies, there are no built in navigational tools for backtracking, where bread crumbs or a back button would be useful.	2	3
There is no way to save search preferences.	1	7
"Keyword search" is more than that; users must remember to use the keyword search to be able to filter results by age, sex, etc.	3	6

Searching the study listings is probably the most common use of Engage. As we discovered in our comparative analysis, Engage appears to have one of the best search engines out there for clinical research studies in terms of functionality and flexibility, but it is lacking in usability. There are several intermediate pages of little value that a user must click through to search and reach their first page of

engage: U-M Clinical Research

results. The help is also not very useful since it is only available from one page. Navigation and search results are not transparent, and this part of the site is not customizable for future use. Some of these problems could be remedied by restructuring the site by audience, removing unnecessary intermediate pages, and using more transparent terminology for links and descriptions of studies.

Findings for Enrolling and Using the Registry

Issue	Severity	Heuristics Violated
Entire enrollment process must be completed in one session; user cannot save data and return later to complete it.	3	1, 3
There is a lot of text to read to find the enrollment link.	3	8
When enrolling, the text on the welcome page after logging in is unnecessary.	3	8
During enrollment, there is little indication of the length of the process or how much is left.	2	1
Errors that show up say "field required" next to the field that is incorrect, rather than identifying by name the field you left out.	1	9
"Click here" is system-specific language that can be avoided.	1	2
Part of the top navigation is inappropriate for the registry part of the site - it has multiple items that return you to the search part of the site when only one is necessary.	3	8
Account Info and Contact Preferences page has a long scroll box with no content.	1	8
If you select to contact studies on your own, the <i>Contact Studies</i> tab still appears without the functionality to move studies there since the button is not available. This tab should be removed, as is the button, for those users.	2	8
Search results do not say what the user searched for, they must remember. The search term should be restated along with the number of results. This will also handle misspellings.	1	1, 9
When you remove studies, there is no confirmation message to ensure the user wants to complete and understands this task.	1	5

engage: U-M Clinical Research

Issue	Severity	Heuristics Violated
Button text is unclear in the registry. For example, "I am in Selected Studies" is confusing text to indicate moving the study into the selected studies tab.	1	2

The online registry is a vital part of Engage in that it is a means by which people may enroll as volunteers. It is a little difficult to access, however, requiring three clicks from the homepage to get to the log in page, followed by another click to actually begin the enrollment process. The large amount of text that is present on these intermediate pages is unnecessary. The enrollment process requires a fair amount of information from the volunteer, and it is important to consider that it might be difficult for people to enter all this information in one session. Although the process permits the user to exit from the enrollment process at any time by pressing the 'cancel' button, it does not provide a way for the user to store some information and return later to complete it. There is no indication of the length of the process at any stage either.

Some of these usability issues could be easily resolved. Having a login link directly from the home page would be one improvement. Also, on the enrollment page, listing the status to completion will give the user clues as to how long the enrollment process may take. For those who may need to save and return, allowing this functionality will give the user additional control and flexibility.

Conclusions

The purpose of conducting this heuristic evaluation was to utilize a quick and inexpensive technique to isolate various usability problems with the Engage website. Certain themes were observed to recur over various sections of the website: for instance, the Engage is very text-heavy, with excessive amounts of text and inline links on several pages including the homepage and the main page of the enrollment section. This impedes the process of navigating through the site, as the user is unsure of where they need to click to get to particular information. There are also a number of intermediate pages to get to important sections like enrollment. Navigating through the site would be easier if the content was divided into sections by audience, for instance volunteers, and study coordinators or study teams.

While searching for studies, there is a provision for the user to refine the search by gender, race, health status, etc. This is a valuable feature, but the term 'keyword search' used to describe it does not map well onto the content represented. Also, study descriptions often contain technical or medical terms that are not defined in the glossary or elsewhere.

Users are required to complete the enrollment process in a single session. Though the option to exit from the process at any time is available, doing so would result in loss of data. It is recommended that the registry save the information entered at each step of the process, so that users may log out and return later to complete the rest of the application.

engage: U-M Clinical Research

The heuristic evaluation of Engage has thus brought to light several areas for improvement of ease of use, each with varying levels of severity. It was of interest to observe that certain issues were so obvious that they were noted by each of the team members while performing the evaluation independently. Our findings will certainly help us as we continue to analyze the usability of the Engage, and begin developing recommendations to enhance the user experience of the website.

engage: U-M Clinical Research

References

Nielsen, Jakob (1994b). Heuristics for user interface design. Retrieved February 13, 2008, Web site: http://www.useit.com/papers/heuristic/heuristic_list.html

Nielsen, Jakob. Heuristic Evaluation. In J. Nielsen and R. L. Mack, eds. *Usability Inspection Methods*. John Wiley & Sons, New York, New York. 1994.

Rosenfeld, L, & Morville, P (1998). *Information Architecture for the World Wide Web*. Sebastopol: O'Reilly & Associates.

Appendix

10 Usability Heuristics

1. Visibility of system status:

The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.

2. Match between system and the real world:

The system should speak the users' language, with words, phrases, and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order.

3. User control and freedom:

Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.

4. Consistency and standards:

Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.

5. Error prevention:

Even better than good error messages is a careful design which prevents a problem from occurring in the first place.

6. Recognition rather than recall:

Make objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.

7. Flexibility and efficiency of use:

Accelerators—unseen by the novice user—may often speed up the interaction for the expert user to such an extent that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.

8. Aesthetic and minimalist design:

Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.

9. Help users recognize, diagnose, and recover from errors:

Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.

10. Help and documentation:

Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.

Individual Assessments:

[Red Text: Indicates Overlap]

Pratibha Bhaskaran:

Violation	Heuristic
Entire enrollment process must be completed in one session; user cannot save data and return later to complete it	1
Language used in the description of studies often includes medical terms, which do not appear in the glossary	2
Clicking 'start search' on the 'find my studies' page leads you to a compulsory quick survey	3
Questions/answers section is long uncategorized list, user has to skim all questions even if they have a question in a particular category	3
Entire enrollment process must be completed in one session; user cannot save data and return later to complete it	3
Find studies main page's navigation does not contain all the same links as 'I need help searching', while left navigation has the extra links 'volunteer feedback form', 'help/contact us' and 'search studies'	4
Engage global navigation on registry changes ; while it is valuable to indicate this change of context, it need not be altered this drastically and may confuse the user	4
The find studies page's left navigation includes links 'volunteer feedback form' and 'post/edit a study'; each is meant for a different audience and is unnecessary for the other	7
Too much text to get to enrollment link	8
Unnecessary text on the welcome page after logging in (to enroll)	8
About research' section is chunked into sections, but is visually monotonous due to text-only approach	8
Several links such as 'multicultural research participation' are provided as inline text links rather than in a navigation panel or a more prominent display. They are however present prominently on the home page	8
Is excessive on the instructions on how to search for studies	10

Liz Blankenship:

- violation of 10: there is no help section to speak of, and the q and a section is more related to research than using the site.
- violation of 1: when they register for the account, there is little indication of the length of the registration process.
- support of 3: you can exit the enrollment process using the cancel button at any time
- violation of 3: when searching through studies, you have to use the back button to go back. there is no clear trail of bread crumbs or back button to use.
- support of 9: when enrolling in the Engage registry, it often tells you when you've entered something wrong or omitted it, in bright red text next to the field that was wrong, as well as something about errors at the top.
- violation of 4: different studies have different amounts of information posted in the description section
- violation of 7: can't save search preferences on the search part of the site
- violation of 8: wordy pages!! not necessary!
- violation of 7: survey thingy that comes up EVERY time you want to search
- violation of 9: the errors that show up simply say "field required," rather than identifying the specific problem
- violation of 2: IRB numbers don't matter to volunteers, and flier advertising wouldn't include IRB numbers
- violation of 2: similarly, people you're recruiting won't understand complex medical terms and probably don't care. it wouldn't be on a flier, so why on this?
- violation of 2: "click here"
- violation of 4: menu looks different on the registry, yet has the same links, and it's confusing to see volunteer for research, find studies, etc. when you're already looking at some.
- support of 7: allows users to search by a number of different characteristics when they choose search by keyword. This helps them drastically reduce the number of studies they have to sift through to find those they are qualified for and interested in.
- violation of 6: "volunteer for research" menu item does not imply
- "contact me in the future when there are studies I qualify for", which is mostly what the registry is for.
- violation of... 3? Staff/volunteer login is the same, not actually any
- different, so the user doesn't actually have control over whether they're logging in as volunteer or staff.
- support of 8: consistent color scheme, goes with U of M site standards
- violation of 8: could have more visual appeal

Tammy Greene:

Violation	Heuristic
No status indicators on registration page (I.e. how many pages the form is where you are in the process)	1
Navigation changes colors and positions once on the registry page	4
"I am in Selected Studies" unclear and to what this button does because of language -- "Put in Selected Studies" or "I am in this study"	2
Not clear how you get studies in the "Contacted Studies" tab if you select that you will contact the studies -- remove tab for these users	8
Current Studies is ambiguous...doesn't mean studies you are participating in	2
Too many navigation options on home page -- too many options bury the hierarchy and overwhelm the user	8
Help is not specific to the context. It is just a FAQ list of questions and answers that must be scrolled through or clicked on for the site and for the registry.	10
Navigation -- volunteer feedback form located under instructions for searching	4
Search term is not repeated in search results -- sometimes users forget, especially after sifting through results	s
Explain what the user did, if the results are not satisfactory -- restate query and number of results	1
Account Info and Contact Preferences Page - long scroll box with no content	8
Additional Resources link error	1
UM Staff link error	1
Do you need the UMHS navigation?	8
No message when click remove studies to ensure user wants to complete and understands this task	5
The help page loads where the work is, prevents seeing the page you need	10
Help is not on the find studies page and being your search	10