

Heuristic Evaluation – MBooks

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Assignment #6

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Overview

This report contains the heuristic evaluation of MBooks, also known as the Michigan Digitization Project. The MBooks project, associated with Google, provides an online access system to the University of Michigan (UM) Library's digitized collections. Access to the MBooks online collection is open to all, although the current core users include UM Librarians, students and employees. Core tasks, needs and demands of these users are described in details in the personas and scenarios previously written for the MBooks Usability project¹.

The purpose of this report is to provide the MBooks interface developers with ideas on how the MBooks user experience can be improved based on findings devised through heuristic evaluations of the system. To create this report the project team worked through a number of steps. First, each of our group members chose two heuristics for evaluation and walked through the MBooks system, performing the multitude of user tasks described in our scenarios, analyzing each step of the process using the assigned heuristics. We relied heavily on Jacob Nielsen's description of his ten usability heuristics². Following the guidelines provided by Nielsen, each group member provided a written mini-report on the tasks they performed working with the system and the description of the heuristics followed. These descriptions included screenshots of various interface elements and a summary of the various functions and pieces of the MBooks interface that could be improved upon. The next step was to compile all these member findings into a cohesive report, structured for our developer's needs. Because the MBooks system is so tightly integrated with the UM Mirlyn online catalog there exists inherent complexity as to how to describe the MBooks system. In order to solve this complexity problem the following report has been structured in a way that provides developers with a clear picture of the sub-systems of MBooks, focusing on the major milestones of the standard user experience. The report contains the following sections:

1. Mirlyn Search interface
2. Search results list
3. Resource Record
4. MBooks Page-Turner interface
5. Help/FAQ

Each section is followed by recommendations where possible solutions for design problems are proposed. The report also includes a Summary of functionality, usability, and aesthetics issues within the MBooks interfaces.

¹ http://www.lib.umich.edu/usability/projects/ProjectReports/SI622MBooks_Interviews_Personas.pdf

² http://www.useit.com/papers/heuristic/heuristic_list.html

Mirlyn Search Interface

Reference Librarians within the University of Michigan Library system are intimately familiar with the search features available to them within the online Mirlyn catalog. This system provides a basic search box for the novice user, but also gives the more advanced user, such as our reference persona, various additional options to tailor their search results. Often when beginning a search to help a student find electronic resources a reference librarian will immediately access the advanced search option (figure 1) to find the desired resources quickly

ADVANCED SEARCH : Ann Arbor and Flint

and
and

Field to search

HINT: You can put "phrases in quotes"
Type word or phrase

Search

Refine further:

Language
Format
Location
Collection

Year from
Year to

HINT: yyyy Use ? for truncation when not using from / to format

Search

Figure 1. Mirlyn's Advanced Search options

and efficiently. In many cases students need to access the library's resources remotely, so the reference librarian's first concern would be to find only those resources that are available electronically, an option that is readily available within the advanced search features. Although the flexibility the advanced search provides is extremely useful for the more advanced user, and since it is usually the primary search option employed by librarians, it may be useful to provide the ability to customize the advanced feature set to meet the unique needs of every advanced user.

Customizing one's search terms within the advanced search option can create lengthy and detailed queries that are often useful across multiple user needs. A reference librarian, or any other advanced user of the system, has the option to save these detailed queries within the user's assigned library account using the 'my saved searches' function. This saving of queries saves librarians and other users time and energy, preventing the need to repeat similar actions.

Although the advanced search feature set provides a great deal of efficiency and flexibility for the sophisticated user it does not give the user ample feedback as to the system status, or indication of where the user is currently located within the Mirlyn catalog. According to Jacob Nielsen, systems should keep "users informed about what is going on, through appropriate feedback within reasonable time." The catalog should provide feedback as to what functionality is available to the user and what section or mode of the catalog search he/she is currently using (e.g. advanced search vs. basic search). When a user enters the advanced search mode the current location is indicated by a label at the top of the search frame stating "ADVANCED SEARCH: Ann Arbor". However, the font and color used for this label is the same as the rest of the font used on the page (figure 2). The design falls victim to the Gestalt principle of organization that states that similar items are grouped together. Since the font is

similar across the page it causes the user to associate the Advanced Search title as part of the body text, making it difficult to immediately recognize what the page's title is.

Recommendations

- Provide better visibility of the system status using bold fonts and highlighted colors
- Allow advanced users to customize their default search options

Search Results List

After an advanced search is performed for electronic resources within the Mirlyn catalog the user encounters Mirlyn's list of search results which has a cluttered feel with redundant information (Figure 3). Digital resources are identified in two ways. In the third column of the

9	<input type="checkbox"/>		La Follette, Robert M.	The making of America. Digital Resource	1906
10	<input type="checkbox"/>			Michigan Historical Collections topical photograph collection. Archive Digital Resource	1860
11	<input type="checkbox"/>		American Forest Congress. Washington, D.C.,	Proceedings of the American Forest Congress held at Washington, D.C., January 2 to 6, 1905, under the auspices of the American Forestry Association. Digital Resource	1905
12	<input type="checkbox"/>		Ingalls, Walter Renton,	Production and properties of zinc; a treatise on the occurrence and distribution of zinc ore, the commercial and technical conditions affecting the production of the spelter, its chemical and phys Digital Resource	1902

Figure 3. Mirlyn's cluttered and redundant list of search results

results list, an item is shown as being electronic and is also identified as a book, journal, visual item, or other format. This is very effective and all kept together in a single space. However, the issue is made complicated by the addition of another icon in the fifth column indicating the item is a digital resource. This layout may confuse the system's users through an excess of information and the presence of icons all over the page rather than grouped together in a single location.

In our primary scenario, Ethan, the reference librarian is called upon to identify electronic resources for a patron who is working from home. Knowing the MBooks system is intended to provide an easy interface for viewing digitized texts, he would prefer to direct the patron towards these resources rather than some of the other, less user-friendly ones. Although the results list provides a great deal of information about the types of resources present (as stated above), and is consistent with its representation of electronic resources with a lightening bolt icon (figure 4), it














7	<input type="checkbox"/>		Rominger, Carl Ludwig,	Geology of lower peninsula [of Michigan] [electronic resource] by C. Rominger.  Digital Resource	1876	• Electronic Resources See URL for access
8	<input type="checkbox"/>			Honpō kōgyō no sūsei / Tsūshō Sanjyō Daijin Kanbō Chōsa Tōkeibu hen = Mining yearbook of Japan / compiled by Research and Statistics Department Minister's Secretariat Ministry of Interna  Digital Resource		• Buhr Shelving Facility - Ask at any library TN 105 .A36 • Hatcher Graduate - Asia Library Stacks TN 105 .A36
9	<input type="checkbox"/>		La Follette, Robert M.	The making of America.  Digital Resource	1906	• Buhr Shelving Facility - Ask at any library E168 .L16 1906
10	<input type="checkbox"/>			Michigan Historical Collections topical photograph collection.  Archive  Digital Resource	1860	• Bentley Historical 92331 UCA.5c 2
11	<input type="checkbox"/>		American Forest Congress. Washington, D.C.,	Proceedings of the American Forest Congress held at Washington, D.C., January 2 to 6, 1905, under the auspices of the American Forestry Association.  Digital Resource	1905	• Buhr Shelving Facility - Ask at any library SD 118 .A5 1905
12	<input type="checkbox"/>		Ingalls, Walter Renton,	Production and properties of zinc; a treatise on the occurrence and distribution of zinc ore, the commercial and technical conditions affecting the production of the spelter, its chemical and phys  Digital Resource	1902	• Buhr Shelving Facility - Ask at any library TN 480 .I44pr

Figure 4. Consistent use of lightening bolt icon to represent electronic resources

is impossible to distinguish MBooks resources from other electronic items in the Mirlyn search results. MBooks resources are not clearly demarcated from the other types of electronic resources available. A librarian or researcher who is looking for MBooks only, for whatever reasons they may have, are therefore forced to remember which of these results were useful to them from a list of many that are not. It is likely that anyone searching will be moving back and forth between different records/resources as they assess their usefulness, creating a heavy burden for a frequent searcher such as our reference librarian. A system that provides this kind of relevant classification information up-front, and on the list of results, would be of great benefit to the user. It is helpful, however, to see information regarding the type of resource (i.e. book, journal, visual) present. This allows users who need to incorporate specific resource types to know immediately if they will be viewing a book or journal.

Recommendations

- Show the MBooks logo within the list of search results instead of including it under the blanket icon for electronic resources
- Decrease the redundancy of icons with their respective textual descriptions
- Employ Gestalt law of proximity by grouping all the icons representing resource type in one area

Resource Record

Once our reference librarian finds a resource of interest within the search results he can click on that record and will be taken to a more detailed view of that resource's information. This record will reveal to the user whether or not the resource is available as an MBook, and

specifically what type of MBooks resource it would be classified as. It is relatively easy to tell if the item can be viewed digitally in its entirety or if it is available for search only because of the prominent use of the icons depicted in Figure 5.



Figure 5. MBooks descriptive icons within resource record

These icons are fairly self-explanatory and give the user a clear distinction between an item that they can use at home for research and one that can be searched for a term's appearance but must be physically obtained for in-depth research. Although these icons are clearly visible, they are often confusing for the more novice user and show a lack of availability consistency within the MBooks system. Oftentimes the reference librarian is left with the burden of explaining the difference between full text and search only resources, taking up valuable time and energy.

The electronic location of each electronic resource is listed on the records page (figure 6). This description contains the MBooks logo, both the full text and the search only as illustrated

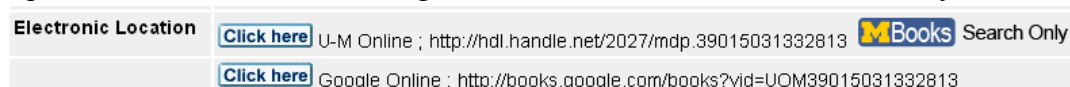


Figure 6. Confusing Electronic Location description

above, as well as the URL for the resource whether that be through the University of Michigan's catalog or Google Books. The description also contains a button with the self-explanatory title "click here". This collection of buttons, text and logos all within the location description causes great confusion for users, especially those that are accessing the information in a hurried fashion. It is tempting to click directly on the MBooks logo, since it is most prominent in the record, and is clearly the information desired by the user. However, this logo is merely a static logo, just as the URL is static text. To access the MBook resource online the user must click on the "click here" button, instead of simply clicking on the icon, or clicking on a hyperlinked URL. Novice users and librarians alike have repeated problems remembering to choose the button because the action goes against the traditional online culture which uses URLs as hyperlinks and logos as buttons leading directly to the resource they represent.

Finally, for those records that contain search only MBooks users are faced with an additional layer of complexity that is poorly addressed in the current system. The search only icon clearly illustrates to the user that the resource is not available in full text, and although this may provide some confusion for the novice user (as previously discussed), it quickly becomes apparent that these resources are only useful to search on. However, when these resources are accessed, through the appropriate 'click here' button, the user is directed towards the MBooks page-turner interface with a message informing the user that the book is only searchable (figure 7). This message is redundant, since the user is already (or should already be) informed of the resource's limitations through the search only icon.



This item is **keyword searchable only**.

Use the search box to find frequency and location of specific words and phrases.

Page images and full text of this item are not available due to copyright restrictions. ([Why?](#))

Recommendations

- Include a search box directly in the resource record for search only MBooks
- Make the MBooks logo clickable, and eliminate redundant ‘click here’ button

MBooks Page-turner Interface

The MBooks page-turner interface is the final step of the process within the MBooks system. This interface opens in a separate browser window, to ensure that the user is aware they are leaving the library catalog and entering the specific resource they chose to access. Figure 8 shows the simple menu bar that is at the top of every MBook. Most of the options available to

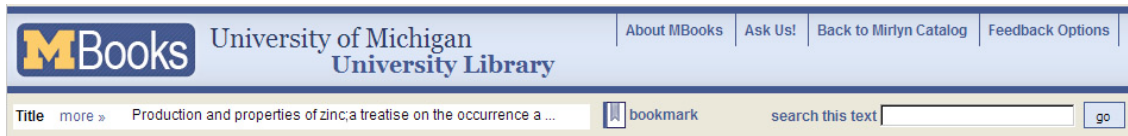
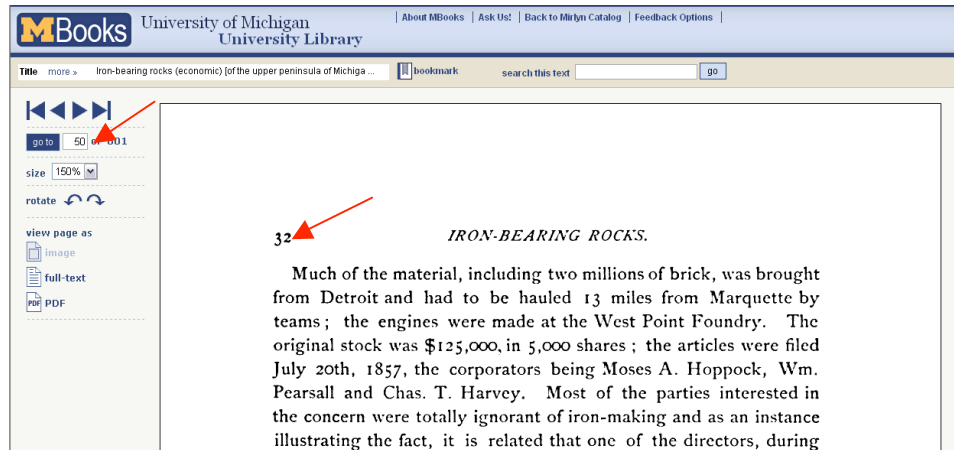


Figure 8. MBooks page-turner menu bar

the user are easily recognizable (the FAQ link will be discussed in more detail later), and the search option is clearly visible at the top of the resource. Although the search box is readily accessible within the resource interface the users must always remember what search terms they have searched in the past, since, unlike the Mirlyn catalog, no list of ‘past searches’ is available. Additionally, there is no way to mark the results of a search in the page viewer portion of the interface.

Although the page-turner display has a clear static menu, the interface poses a number of inconsistencies, which cause confusion and frustration across all user populations. Pagination is among the more confusing aspects of the resource due to a difference in the actual page number of the scanned book versus the page number of the entire scan as a whole. For example, one could type in the preferred page (i.e. 50) but the page number in the actual book that has been scanned is different (i.e. 32) as in figure 9.



The system also inconsistently references the page numbers using either the word ‘sequence’ or ‘page’. The word “sequence” is used to denote the scanned book’s digital reference page number. In the example above, the sequence number is 50. When a search is conducted for a specific term within the text the user is taken to a search results page which shows the sequences in which the search term occurs. However, there is no definition or explanation for this organization scheme and the search summary uses the word “pages” to denote a “sequence” (figure 10). It should be noted that this is a known and temporary issue with the metadata and the MBooks developers are currently working with Google to obtain the additional page number metadata.

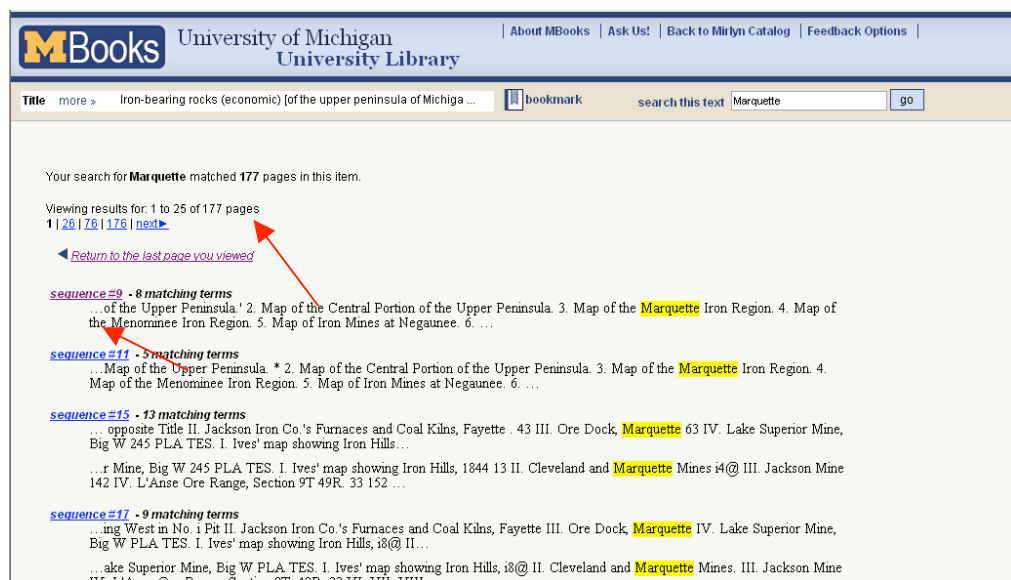


Figure 10. Confusing use of ‘sequence’ and ‘page’ labels

Additional pagination problems arise when a user enters the wrong number in the MBooks interface. For example, if the scanned book is 97 pages but the user types in '98' the interface does not respond, but merely stays on the current page with no error message indicating that an incorrect page number was entered. However, when viewing a resource as text and an erroneous page number is entered a second time the interface will display the message shown in figure 11.

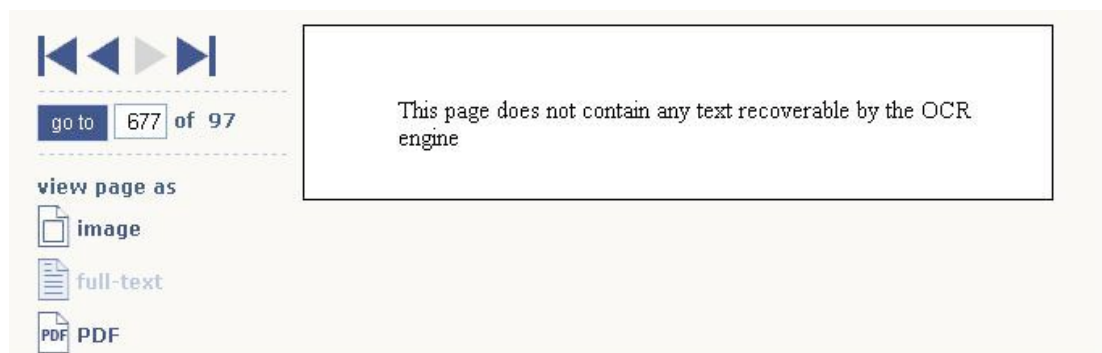


Figure 11. Message encountered after second page number error

The error messages associated with pagination may be confusing, but the system also provides some valuable feedback for user errors in other aspects of the interface. For example, if a query is performed and no matches are found within the book an error message appears within the resulting page as illustrated in figure 12. This statement is clear enough for users of all



Figure 12. Message for an empty search result set

expertise levels to understand that the book does not contain any relevant matches. In an effort to avoid other possible user errors the system also supports the browser backtracking function, in addition to the forward and backward functionality provided within the MBooks system. This integration into the user's current browser makes movement within the resource very familiar and efficient.

The page-turner system provides valuable feedback in other ways as well, especially when it comes to representations of the system's status. When a user enters the MBooks interface they can clearly see, through the system's color-coding, which options are unavailable to them, as shown in figure 13 which indicates that the user is not able to browse any more forward within the resource.



Figure 13. Example of disabled browse option

However, this color-coding is not consistent within the text labels contained on the left-hand interface menu. This menu lists icons and text showing the various viewing options for the resource (image, full-text, etc.) as exemplified in figure 14.

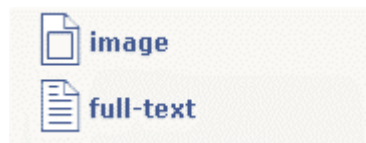
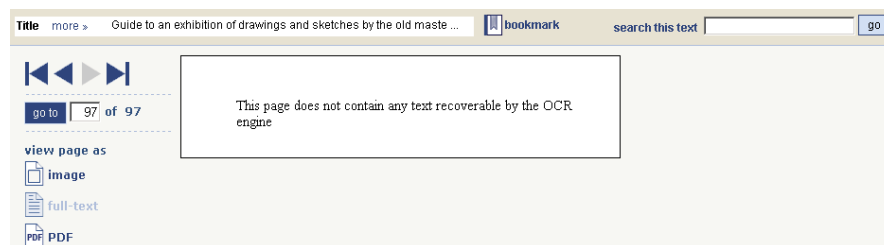


Figure 14. Resource availability menu options

However, these icons and text are always highlighted in the active dark blue color, even if the text is unavailable in a certain form. When a user clicks on an unavailable option a message is displayed stating that the resource is unavailable in that form (figure 15), but it would be more consistent to simply gray out the unavailable option to prevent the user from clicking on it.



The MBooks page-turner interface succeeds in various ways of integrating user's familiar online culture in order to appeal to a wide audience. Specifically we can see that the system speaks the users' language with words, phrases and concepts that are user rather than system oriented. The MBooks interface makes good use of easy to understand language, especially in labeling the options 'image', 'full-text', and 'rotate', preventing users from being confused by computer terms such as '.jpg' or 'OCR'. However, the system also contains some violation of logical online component order, which goes against what users would be used to from other online activities. When a user enters the page number he/she wants to view they have to first enter the number and then click on the 'go to' button. However, in this interface the 'go to' button is located on the left side of the search box (figure 16), which is contrary to the majority



Figure 16. Example of unnatural button placement

of other online search fields in which the search button is on the right side of the text field, reflecting the natural reading order of left to right.

A final problem users encounter within the MBooks page-turner interface is the confusing and temperamental bookmarks feature. The interface includes an "add bookmark" option within the main menu bar of each resource, leading a user to believe that the bookmark metaphor would seamlessly apply to the interface and allow the current page of an MBook to be stored for easy consultation at a later time. However, when the bookmark feature is utilized the system adds a bookmark to the user's browser. This bookmark refers back to the MBook

resource, not to a specific page within that resource. Also, the bookmark behaves oddly in browsers such as Firefox, opening in additional frames as opposed to a new window or tab.

Recommendations

- Provide shortcut keys to help advanced users easily browse texts without the use of a mouse
- Provide feedback on how to improve queries to obtain more exhaustive search results
- Improve the bookmark feature to refer to specific pages, and to be stored within the library accounts to be accessible across browsers

Help/FAQ

MBooks does have a few issues that may become a detriment to locating and remembering important help information. The first of these relates to the terminology used for the help links (see Figure 17). The phrase “About MBooks” leads to the MBooks’ FAQ page. It

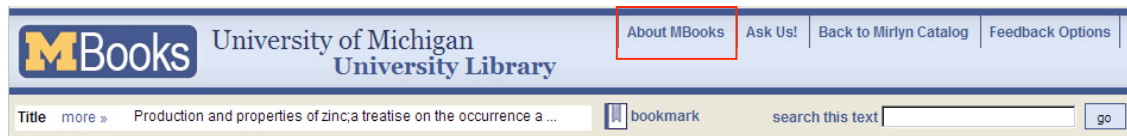
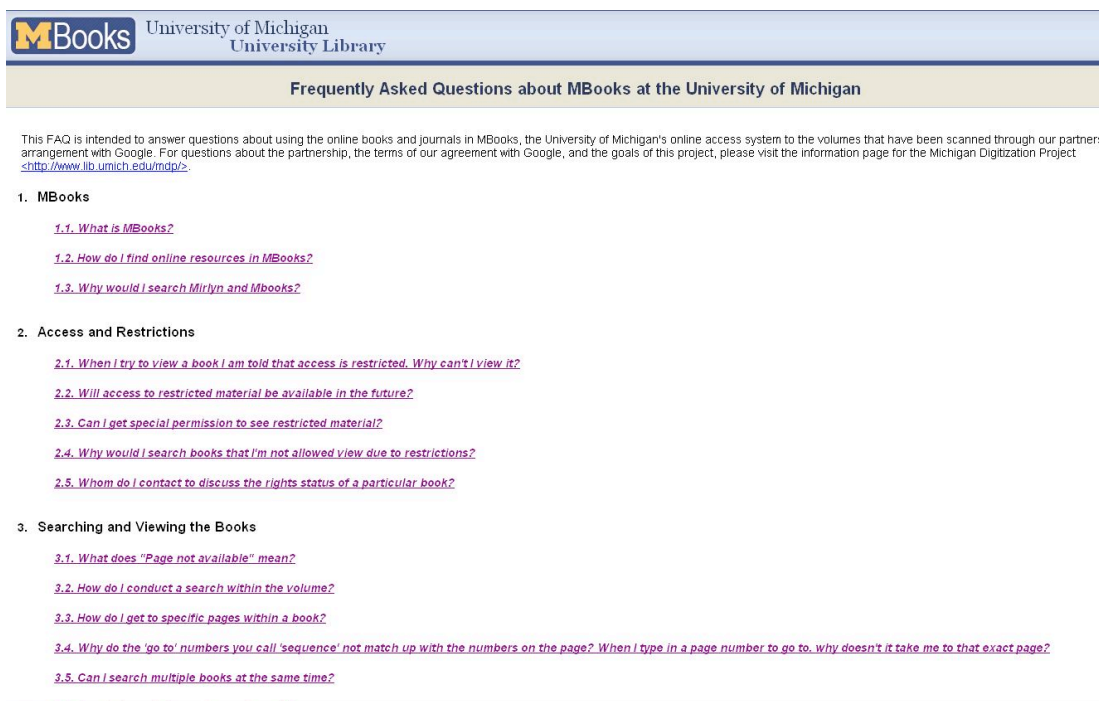


Figure 17. Page-turner menu bar highlighting help confusion

seems that “FAQ” might be more appropriate for recognizing this option, as this term is somewhat ubiquitous in the computing realm and it should always be preferable to call something what it actually is. “About MBooks” may give the user the false impression that this is a link to information about the MBooks project, which can be found at the Michigan Digitization Project (MDP) homepage (<http://www.lib.umich.edu/mdp/>).

Another potential issue arising from this configuration is that users, if attempting to make use of the information in the MBooks FAQ *as* they are using the interface, will have to jump back and forth between the FAQ and the page viewer to utilize the advice given. Thus, users are forced to remember information from the FAQ and then go back to the viewer to use that information. This would be especially confusing for novice users who could easily get lost in the system. Additionally, if a task's instruction and performance were conducted together, it may aid the user in recognizing the necessary procedure for their next MBooks experience.



Although the path to help resources can often be confusing, the resources themselves are often advantageous for even the most advanced users. Those users unfamiliar with MBooks can find a great wealth of information on the FAQ page (figure 18). It is not too long to read while still providing in depth information to users. If the FAQ page does not contain specific information related to the user's needs, as may happen for more advanced users, there is also the "Ask Us Now!" option (figure 19). This feature puts the user in direct contact with a reference librarian, such as the one described in our persona.

Need Help? Ask Us!



Figure 19. "Ask Us Now" options

Recommendations

- Add an FAQ link and redirect "About MBooks" to the MDP homepage or re-label this option as FAQ
- Open the FAQ in a popup window to keep the user's place within the MBooks interface

Summary

Functionality

While searching is easy to locate, self-explanatory, and useful, it still lacks certain functionality to decrease the user's need to remember easily forgotten information and return to a particular point when moving from source to source – a regular activity described by the berrypicking model³. Allowing a user to bookmark or otherwise note a particularly useful page is crucial for research in a digital environment and necessary if the objective is to keep the user from having to personally remember a great deal of citation information. In MBooks, the bookmark feature is poorly developed and prone to errors and confusion and does not allow a user to easily navigate back to elements of the resource if the user is forced to digress from their initial path.

MBooks does, however, keep in mind that an item's citation information is important information that should be accessible from all points in the process of using MBooks. To the left of the "Bookmark" link is a box of text with this information. While returning to an MBook's Mirlyn record is possible through a clearly marked link, this gives the user apparent access to extremely useful information without having to change pages.

The Mirlyn and MBooks system provides a number of useful options that give more advanced library users greater flexibility in their searching and browsing. While still keeping the default search interface simple for the novice users, the Mirlyn online catalog provides the ability to perform advanced searches for the more experienced patron. Also, the system allows more advanced users to save their recent searches, thus saving users' time in their frequent and repetitive searches. Although the system is adaptable for more advanced users there are a number of features that could be created to provide greater efficiency for users who use the site often. One such addition would be the ability to search only for MBooks. This would save users the time to search through all electronic resources until an MBook resource is found. Another feature missing from the MBooks' page turner interface is the incorporation of shortcut keys. These shortcuts could be applied to the page flipping and browsing features of the interface, thereby allowing users greater efficiency in reading the resources online.

Overall, the user control and freedom in MBooks is excellent. It is efficient and effective, allowing users to conduct business without unnecessary pop-up windows. The simple interface does not require additional explanation which is also a benefit. Integration of the Web browser with the resource interface gives users additional options to "escape" out of a window they did not intend on navigating to, which is another efficient and effective method utilized by this resource.

³ Bates, Marcia J. (1989). "The Design of Browsing and Berrypicking Techniques for the Online Search Interface." *Online Review*, 13(5): 407-424.

Usability

Overall consistency in Mirlyn to MBooks is poor. The distinction between a general electronic resource and an MBook is vague and made even more confusing for users when trying to distinguish the difference between a full text document and a search only document. The recommendation is to utilize the MBooks logo in a more visible manner so that the collection is more quickly and easily recognized. An explanation regarding full text and search only is also needed for novice Mirlyn users.

Overall consistency of the MBooks page-turner resource, itself, is average. While the basic functionalities work quite well, the details of pagination differences and vocabulary differences are confusing to users. The recommendation is to use a consistent vocabulary when referring to page numbers and to create a solution which will allow the scanned books' pagination to match the visual representation of the actual books' pagination.

Although the Mirlyn library catalog provides various messages to show which actions within the system are not possible there are a number of areas in which the system could change options to prevent these errors instead of showing messages after the error has been performed. For example, within search results the system shows icons to represent the type of resource available (a book to indicate the resource is a book), but the results list also displays repetitive text along with the icons (the word 'book' printed beneath the book icon). None of these icons specifically represent an MBook, so perhaps instead of the repetition of words and icons it would be more beneficial to the user to give greater detail about what sort of electronic resource is available. This would save the user the time to click through a number of resources until an MBook is located.

Also, there is confusion within the resource record page indicating where a specific electronic resource is available. The page shows a non-selectable MBooks icon, a non-hyperlinked URL, and finally a redundant button that states 'click here' to access the actual resource. In order to prevent the user from incorrectly clicking on the icon or the URL to access the book it may be useful to eliminate the redundant button and simply make the other options clickable. Finally, the system could easily prevent the error of accessing the 'search only' MBooks interface only to discover the message stating the resource is search only. Providing a search box directly within the resource record the system could prevent the user from ever seeing the message.

Jacob Nielson, discussed previously in this report, stated that the help and documentation should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large. The FAQ page for MBooks is not easy to search because it does not clearly state itself as FAQ page but is as "About MBooks". In addition, the "Ask Us" section is misleading because users are apt to treat it as the FAQ page while it is actually the help page for Mirlyn. But the FAQ page itself is very instructive, with a question index for the user to browse through the frequently asked questions and "back to top" function which facilitates convenient browsing. In

addition, it lists the essential steps for searching in MBooks but is described in concise language, which is comfortable to read.

Also, according to Jacob Nielsen, error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution. There are inconsistent responses to a wrong page number entry as well as unclear error messages that might confuse users and require them to figure out the problem on their own. The error message for “no match found” is clear but not instructive. It could be better with suggestions on the search query that can have better search results. The message on “search only” books is easy to understand and although there is no suggestion on possible full text solutions, it explains the reasoning by leading users to the explanation on the FAQ page.

Aesthetics

Nielsen states 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.”⁴ Library user needs require that locating an MBook be easy, that using an MBook be easy, that searching an MBook be easy, and that certain information be present but not obtrusive (i.e. citation info). Certain problems do arise as we trace the path of a user’s activities, but MBooks generally maintains pleasant aesthetics with simple menus and transparent functionality. For instance, the function menu at the left of the browser window portrays all options with easily interpreted icons that are grouped well with respect to their theme (these are all repeated at the bottom of the page image). Additionally, text search results are well laid out with nothing more than links to a term’s location and a snippet of its surrounding text. Finally, citation information (which may be necessary at many stages in a user’s scenario) is located in a very apparent place on the page and is expandable in order to minimize the footprint left by this text in the default state. This simplicity when representing the available functions for the page-turner interface should be maintained and emulated wherever such a menu, group of icons, or potentially distracting text is present. The primary aesthetic issue arises not within the MBooks interface itself, but on the path to MBooks from Mirlyn.

⁴ Nielsen, Jakob. “Ten Usability Heuristics.”

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