The Virtual Shelf

Final WriteUp

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Abstract

The goal of the Open Library is to make all published information available to every person on earth over the internet, via the creation of an enormous wiki, with each book represented as a single page. In the interest of making this library more usable, we have created a visualization that allows users to view collections and search results as a "shelf". The purpose of the visualization was allow tasks from real world library browsing to be performed more successfully in an online environment. In addition, we hoped to leverage some of the various advantages to visual metadata and object context. In this study we explored usability and aesthetics issues related to this design, as well testing user responses to design functions and applications. Specifically, we sought to establish ease of learning, compare the visualization as a tool for navigating search results to existing systems, compare our method of saving records to existing systems, and get user input on possible uses of color and text for representing the resources. In addition, we were looking for usability problems and user input throughout the above. Covered in this paper are the background findings that identified the need for this design, the methods involved in our 15 user study, a discussion of findings and design imperatives based on the study, and a breakdown of some of the features of our final prototype.

Introduction

The Open Library

Founded by Brewster Kale, creator of the Internet Archive, the Open Library project is a not-for-profit organization that seeks to make information about all published work (including full text of works in the public domain) available to everyone on earth free of charge. It is designed to work in parallel with the efforts like Google Books, as Google books is a proprietary effort that imposes restrictions on the works that it digitizes. In the service of the goal of universal access, the Open Content alliance was founded to help bring together donors of materials and funding. This organization claims as members major libraries across the country, as well as major corporations and organizations such as Yahoo and Adobe.

The Open Library takes the form of an enormous wiki, in which each page represents a separate book. From these book pages, users will be able to read full text versions, print copies on demand, see links for finding the book at a local library or though online merchants. In addition, a number of user content based functions are slated to be included. Some of these features include reviewing and annotating, books, as well as the ability to save custom collections. While this project is currently in the pre-launch stages, a demo may be found at: http://demo.openlibrary.org/.

Two parallel tracks are in place for adding content. Books are being scanned into the system as funding and copyright permit. At the same time, the Open Library is obtaining catalogs from various different sources, including the Library of Congress and Amazon.com, and incorporating them into the system. At the time of writing, there are more than 13 million books in their system, including over 230,000 with full text.

To facilitate interaction with this system, we have created a visualization we call the Virtual Shelf.

Background Research

Contextual Inquiries and Interviews

The virtual shelf arises out of contextual inquiries performed with librarians and library patrons, as well as interviews with librarians. These studies revealed that the Library of Congress subject classification system is extremely powerful and nuanced, providing a wonderful resource for users who can master it. Far more important, however, is the fact that no one does. We were told by librarians that the only users who truly take advantage of this system are highly skilled researchers who began honing their search skills long before the digital age.

Instead, nearly all user users approach research by either performing a general subject keyword or title search on their topic, or by searching for a title of a book they know falls within the field they are researching. The randomness of the process is even more pronounced with younger and less experienced users (often referred to as the 'Google Generation' in interviews) who, rather than even bothering with the current library catalog search filters, simply type a query into the search bar and hope for the best.

Once users receive the results, they record the call numbers and physically go to the areas of the stacks that hold their books. Once there, the look not only for the specific book they searched for, but also for others nearby on their topic. This also has the added benefit of exposing searchers to other useful books that might not be what they expected to find. This system is not a work-around, rather librarians suggest it to users and one of the librarians told us that this is how he searches.

In addition, we noted repeatedly that both patrons and librarians identified books in non-standard ways. Rather than remembering the title, author, or call number, users often asked for books by color, size, or location. Librarians confirmed that it was a common occurrence for them to receive requests for the “big grey book” in whatever subject.

Design History

Leading up to our current state of extensive testing on users with our high-fi interactive prototype, we went through several stages including contextual inquiries, developing tasks, defining personas, and undergoing heuristic evaluations. To start us off, we came up with three very distinct personas that was representative of our user base. There was Joseph Chan, a technologically savvy GSR who is a veteran of the computer and information sectors, Professor Hacksworth, a traditionalist, tenured professor whose habits are deeply rooted in the traditional library setting, and finally Victoria Hutchens, a high school freshman who is a novice in both research and technology use. These contrasting personas are representative of the different skill sets and comfort levels of our project's user base. The tasks that these individuals underwent included those of accessing the library contents from home during research sessions as well as just finding relevant books in the library. Our goal was to demonstrate that regardless of location, the contents of the library are easily accessible through our interface.

After the development of these personas and tasks, our prototype underwent a heuristic evaluation by other groups. Following Nielsen's Heuristics of Simple and Natural Dialog, Speaking the User's Language, Minimizing User Memory Load, Consistency, Feedback, Help and Documentation, these guidelines helped the groups point out certain inconsistencies that were in our system. After careful scoring and brainstorming sessions, our group worked out both the high level and low level design issues and honored the suggestions of the other group. Additionally, we checked with the stakeholders to make sure that these changes were truly the best for the system. Most of the issues brought up were those of usability, buttons, and navigation; as a result, this led us to a nice upgrade of the interface. To get to the

point that our prototype is currently at, there were several stages that the prototype had to undergo for there to be agreement among designers and users.

Target Population

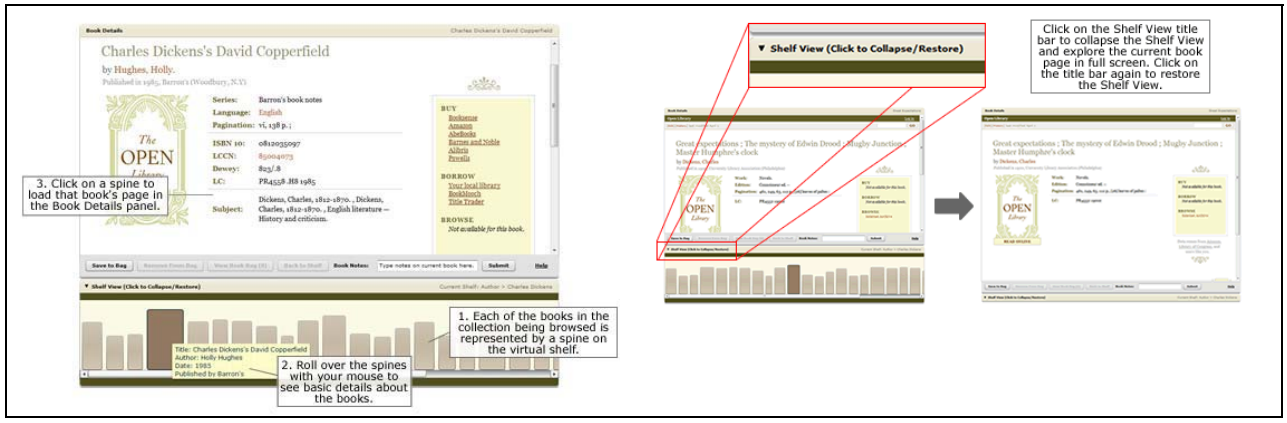
The target user population for this visualization is extremely wide due the mission of the client for which it was produced and its versatility. The Open Library project seeks to serve as a starting point for all book searches on the internet, providing full text of some books and social functions and location links for all of them. As such, anyone who might use a library has a reason to use this visualization.

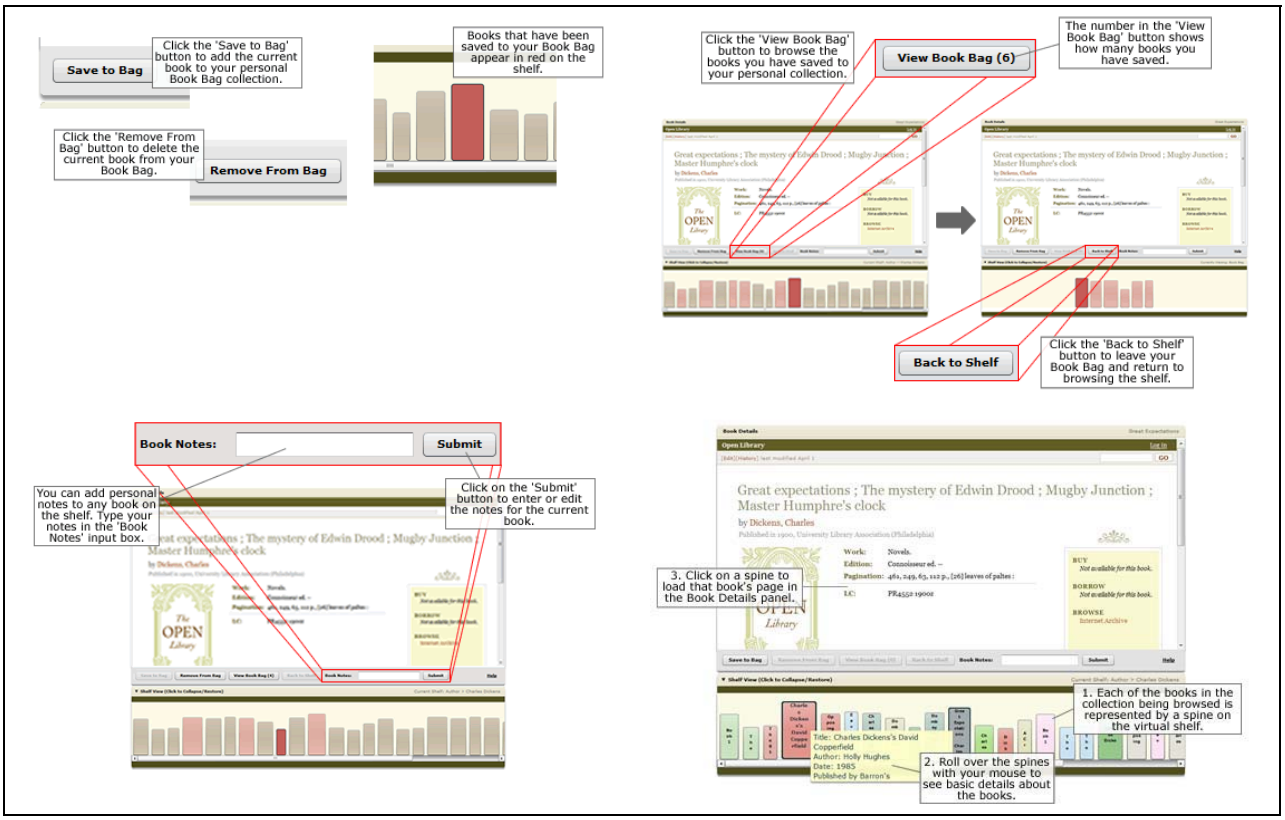
Prototype for Testing

The Virtual Shelf (built in Adobe Flex) presents users with a virtual representation of a book shelf, complete with graphic representations of book spines in a collection of resources. Users can browse basic information about the books by mousing over the spines, which grow when focused on, and viewing a tooltip displaying various metadata fields. Users can click on the spines and view a book's full Open Library page on the Book Details panel above the shelf. The shelf can be collapsed to view the book details in full screen. Users can add books to a “Book Bag” and can toggle between viewing the custom collection and the shelf. Books change color (or border color) when added to the Book Bag. Users can also add notes to the books they browse. Book dimensions are meant to represent actual physical dimensions of the books. Since dimension data was not available for the data sets we used to populate the shelf, width was assigned based on number of pages in the books, and height was assigned randomly.

The following figures outline the prototype version of the Virtual Shelf we used for testing purposes. Two versions of the Virtual Shelf were utilized for testing purposes – one with a single color for the book spines, and one with varying colors.

Figure 1. Virtual Shelf testing prototype.





Methods

Testing Procedure

For the purpose of testing, we broke down our user populations into three groups: high school students, college students, and post college users. We ended up testing with 15 users. We were able to find a range of user proficiency and education levels. We tested on 8 college users, three of which were UC Berkeley School of Information students and three of which were undergraduate freshmen. For this testing procedure, users were asked to perform a set of three tasks while thinking out loud to highlight any difficulties or confusions they were encountering.

There were two different banks of tests, with each making two comparisons. Both tests were responsible for exposing design issues. For the first test bank, the goals were to establish whether viewing search results on the virtual shelf added some value as opposed to traditional systems, and whether our design would produce significant learning effects between first and second exposure. The goals of the second bank of tests were to examine whether the feature of adding books to a book bag was useful compared to existing systems of saving book records, as well as if adding certain aesthetics features to the virtual book spines improved user satisfaction and experience with the system.

Ideally, we would have been able to test our prototype by connecting it the Open Library database. However, they did not have an API in place at the time of testing. Instead we were forced to use data sets from three search results from the Open Library.

The American Revolution was selected to be the superset of data that the test data subsets would then be based on. This data was chosen due to the fact that it is a broad enough subject to accommodate various subcategories, as well as the supposition that there would be a good number of full-text scans within this subject area.

User Tasks

Utilizing shelf access functions (test groups 1 and 2)

Both banks of tests began with users being told to envision that they were conducting research for a project dealing with the British perspective on the American Revolution. They were told that they had entered the search terms “american revolution british” into the Open Library search engine and then chose to view the results as a single shelf. Users were then asked to find four books they thought would be useful for said project. Once each book was chosen, users were asked to write down the book's LC call number, add the note “AR Project” to the book’s notes, and save the book it to the book bag. At the end of the task, users were asked to view the book bag. Observers timed this task and took note of user usage patterns, features, and any difficulties the users had in finding and utilizing any functions.

The purpose of this task was to ascertain whether users understood all of the basic features of the visualization. It also served as the test condition that was compared to control conditions in subsequent tasks.

Absorbing relevant books (test groups 1 and 2)

Users in both of the test banks were then asked to, without looking at the screen, tell the tester everything they remembered about the books they selected and any surrounding books.

The purpose of this task was to test whether having books presented with visual properties would increase recall. When compared to traditional systems of text-based lists.

Visualizing search results (test group 1)

Users in the first testing group were then told that they were researching the role of women in American Revolution. They were then shown the Open Library’s existing search interface with the results for the keyword search “american revolution women”, asked to find four books they thought would be useful, and instructed to record their LC call numbers. After respondents performed this task, they were asked again what they remembered from the books.

The purpose of this task was to compare traditional text-based listings of search results with our Virtual Shelf.

Visualizing a collection of books that you have created (test group 2)

Users in the second test group were instead shown the UC Berkeley Library's Pathfinder search system results for “american revolution women” and asked to save the records of four books they thought relevant. Upon completion, they were asked to view these records.

The goal of this task was to compare our book bag system to existing systems for saving records, and query whether users preferred the book bag visualization over traditional systems and had an interest in seeing the feature expanded.

Learning effects (test group 1)

The final task for the first test group was to repeat the basic utilization task, except for the subject of the French perspective on the American Revolution and the results for “American revolution French”.

The purpose of this task was to observe whether users had mastered the features of our interface and whether learning effects occurred. The time for task completion was compared to the first time collected, as well as observations of user confidence of utilization.

Aesthetics effects (test group 2)

The final task of the second test group also asked about the French perspective, but instead used a version of our visualization with colored spines, and parts of the title visible on the spine.

The purpose was to look for radical departures from trends found by the learning effects test, as well as to gather feedback from users as to whether they thought these changes helpful. The entire testing process lasted approximately 30 minutes per user. All testing materials can be found in the attached Appendix.

Findings and Discussion

General findings

Value as a search visualization tool

Overall, while we could not claim a majority of users were faster at finding what they needed using the Virtual Shelf versus traditional search results lists, a substantial majority still appreciated the design for a variety of reasons. Seven of the 8 users who responded to the question either agreed or strongly agreed with the statement that overall, the Virtual Shelf would improve their experience in an online library setting (see Appendix).

One of the most pertinent issues is whether users understand how books were organized on the shelf visualization. Based on the results, the conclusion seems to be that they do not, but that this only bothers very few users. Only two users reported confusion with this conceptually, guessing originally that they were instead looking at a general shelf truncated by data-set limitations. It could be that other users made this assumption and did not mention it.

However, if a user knew that the shelf was sorted by relevance, than that user logically began browsing at the left-most book, as it was deemed to be the most relevant to the search. A great many users did not do this. Rather, a sizable proportion of users began a few books from the left, or in the middle of the first screen, a move that makes sense if you are viewing a shelf visualization based on the physical library.

One of the main points of value added by the Virtual Shelf is avoiding having to click back and forth between the search page and the book pages. One user excitedly noted that he could not wait for this to come out, as he was sick of opening separate tabs on his browser.

Multiple users also reported that they preferred the results placed on a scrollable shelf, rather than on a paginated set of results. It should be noted, however, that users were looking at shelves of under 100 books. This gain may be diminished as the number of books becomes greater.

One user asked if there was any way to "narrow the search". Another pointed out that he felt the traditional search result view was easier for visually scrolling through, while our version offered better recall. The user went on to suggest combining the two. This is a reasonable proposal, especially because the Open Library's search interface already offers a strong system of filtering by facets. As such, one possible solution to this may be add a button to the shelf that allows the user to return to the list of search results in the top panel. Once on the search page, the results of the search can be filtered, causing the shelf to dynamically update.

A problem that gave more than half of our users pause, but did not derail the session was the finding of repeating records. There is not much we can do about this as this is a function of the collection, though one possible option to explore might be a button to filter duplicate versions out.

Absorption

It was really difficult to draw any conclusions in this area. Users remembered all manner of different aspects of the collection. Some remembered subjects, some remembered parts of the titles, and some remembered general features of the shelf. Three users, however, did cite size as a factor of the books in their collection, with two claiming to be attracted to the thick books, and one worrying over what he might do with a massive volume of poetry.

It should be noted, however, that this is a rather difficult piece of information to pin down. Users were only asked what they remembered about the collection, and may have interpreted what we were looking for differently.

Custom collections

Users had little to say about comparing our shelf with the traditional system, though this may have been due to the way the task was designed. As all users had to do was save the record straight from the search page (good design on their part) it did not expose the fact that pressing the back button removes books from the record.

In general, though, users generally reported that they felt being able to save relevant books on the shelf to a custom collection was very useful.

Learning effects

Nearly every user demonstrated significant time improvement, ranging from one minute to as long as five minutes.

A number of users were unsure of what to do at the beginning of the study, when the shelf was presented with a blank page in the book details panel. This confusion usually decreased once they tried clicking on one of the books. Other users began by clicking on various books, trying to get a sense of the functionality. However, by the final task, all users were utilizing tooltips to scan the shelf, only clicking on books that they wanted more information on.

The learning effects test can be deceiving, as some users who grasped the shelf instantly, gave low scores for learning effects due to the fact that nothing became easier. The other important factor to

remember is that this test took place while users were thinking aloud and would periodically explain something that was giving them trouble. Users were more likely to find these problems during the first run-through, and this might have inflated the times.

Functionalities and design issues

Shape and size

Only one user did not realize that the representations were supposed to be books, thinking that the "shelves" in question were not metaphorical shelves referencing a real-world occurrence, but instead a computer term referencing the two different panes of the shelf and book page. However, this user was using the interface in a low visibility environment, and was still able to complete the tasks, despite not understanding the interface's metaphor.
Only one user reported that he knew they were supposed to be representative, but did not like the visualization, while two users reported that they based decisions on some of the books based on size.

Thirteen of the 15 users reported that they agreed or strongly agreed that the different sizing of the book spines helped them visually separate the books (see Appendix). Accordingly, the majority of users seemed to agree that having the different sizes made it easier to navigate the shelf by breaking up the visual appearance, rather than having an undifferentiated block of books.

Titles

Nearly every user that did not see a version with titles on the spine requested them. Users cited various reasons, including helping to identify rectangles as books, helping them keep track of what books they had already clicked on, enabling them to visually scan the collection more quickly.

However, the majority of users who saw the books with titles did not like them. Users cited a dislike of the vertical orientation and truncation. One user said that because thicker books can fit more of the title, they were given undue importance. One went as far as to declare them unprofessional looking.

One user, however, said they were helpful, even in their truncated form as they provided subject anchors for the books.

Based on these results, it seems clear that titles are important, but we need to work to improve their utility in later iterations.

Color

Color was a universal success as compared to the non-color version. Two users strongly agreed, 2 agreed, and one was neutral when responding to the statement that color coding made the books easier to remember and differentiate (see Appendix). There were no complaints about adding color, and at least one user reported high value added. It is not clear that users understood that the colors were supposed to represent the color of the books spines, however, and testing will have to take place to decide if spine color is truly the best use for the important aspect of color in a visualization. Color could possibly used for several different functions, including identifying groups of books based on various features, popularity data, etc.

Book notes

The book notes caused confusion for virtually all of the users. The first problem was that the book notes entry field does not appear until a book is selected. This is an easy enough fix, with the field always present, but grayed out until a book is selected.

Secondly, users were confused when no visual feedback was provided when a note was submitted. Also, users were unsure where the notes "go" after being entered. Users vocalized the importance of notes be easy to find and retrieve. The next design addresses this by making notes appear as post-it notes when the book is selected, and adding a notation visible on the spine when a book has been annotated.

Two users suggested dynamic note suggestion for the notes field, similar to what you find on tagging sites, the logic being that if a user has given the same note to four books, he or she may want to quickly add it to subsequent books. Also, seeing notes left by other users might be helpful.

Finally, there was a request for the ability select and notate multiple books at one time. This is a feature we will want to explore in later versions.

Tooltips

By the end of the testing, all users demonstrated an understanding of how to use the tooltips. When asked what they would want to change about them, one user suggested adding various call numbers. This might have been influenced by the fact that this is what the task asked for. Another user professed annoyance with the excessively long titles of certain books appearing in the tooltip. In the service of fixing this, we have set the titles to truncate after a certain number of characters in length.

Three users cited problems with the tooltips overlapping other books. While users can still click books under it, it made browsing more difficult. One possible solution to this problem might be to make the tooltip box slightly more transparent, so that books under it are not hidden

Also in response to user requests, we have added an area for average rating (in the form of stars) to the tooltip. This is expressed in stars, but lacks the data to be fully functional at this time.

Book bag

Six of the 7 users surveyed felt that that being able to save books they were looking at on a digital library system was an important feature, while 4 users either strongly agreed or agreed and three users were neutral on whether they would be interested in creating and labeling multiple custom shelves (see Appendix). As if anticipating our next design iteration, one user looked at the book bag page and asked if there was a way to create and save what he called "sub-book bags". As such, we have added an initial version of a feature to allow users to save their book bags as custom shelves.

User were divided over whether they would be interested in sharing custom shelves they created (4 users were neutral to the issue, 2 agreed they would like the feature and 1 user disagreed; see Appendix), some saying that they did not think anyone else would be interested.

Most users responded positively to turning the books red once they were added to the shelf. A few remarked that it was "cool". One user, however, suggested some other kind of placeholder for the books other than color to show that the book was no longer on the shelf.

Remembering books already looked at

One rather serious problem that a number of our users encountered was remembering what books they had already clicked on. In the classical library search system, this is at least somewhat helped by the altered visual appearance of previously clicked links. Also, because of the fact that there was little feedback when book notes were added, it was hard for users to find a book they had already annotated.

Users who added books to the bag did not seem to encounter this problem. In addition, adding the post-it icon to the spine in the next version of our prototype should address this problem to some extent.

Interaction

Interaction with the shelf was designed to be relatively simple, users were able to use it to execute all tasks successfully. There were however a number of suggestions from various users.

All 12 of the users who responded to the question agreed or strongly agreed that the growth of the book being moused over was helpful (see Appendix). This is useful knowledge as there were disagreeing opinions in the pretesting stage.

A number of users reported that having the book being viewed darken was a strong feature. One user suggested, however, that books being viewed, rather than just darkening in color, should be replaced with an open book icon. This is a feature to test in later iterations.

One user attempted to move between books with the arrow keys. Only one user attempted this, but it seems a reasonably strong feature to try to implement. However it will be difficult to implement and might have other repercussions that should be tested. As such, it will have to wait for a later version. A few users suggested making the shelf bigger and one suggested being able to adjust it like a frame. Making the shelf bigger decreases the space available to view the book page, which is already highly limited on some laptops. However, the ability to manually adjust the size is an attractive one, and while it may be difficult to implement, it will be a priority in later versions. Few users took advantage of the toggling function of the shelf, probably due to the fact that the user tests were all done on sufficiently large computer screens.

Finally, some users proposed adding more drag and drop functionality to the design. This will be an interesting, though slightly less essential feature to explore in later iterations.

Other

Finally, a pair of users suggested that the design would benefit from adding a note pad to the design. Users could copy and paste information to it, and make general notes, which would then be printable. Also, lack of a help function was a noted deficiency of our initial prototype during the heuristic evaluation, so we added a help link that displays a detailed explanation of the Virtual Shelf functions with multiple figures and screenshots. While users may have been pleased that a help link was provided, none of the users clicked on the help link even once during testing. Hopefully, this suggests that the visualization is largely self-explanatory and intuitive!

Revised Prototype

In response to user testing, we revised the prototype and addressed many of the issues raised and suggestions from users in the testing phase.

Design suggestions and status of implementation in revised prototype

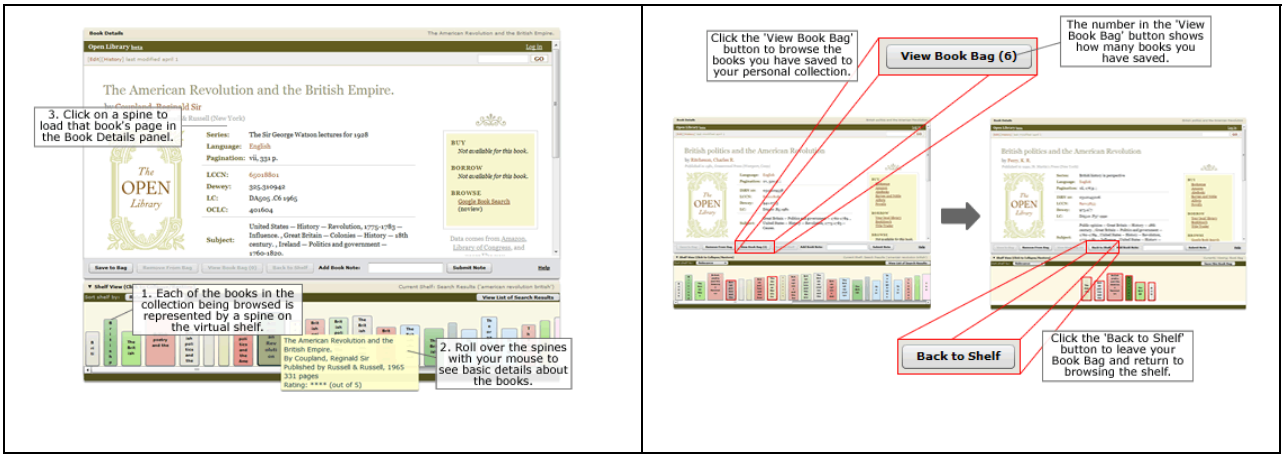
- Making notes box appear even when no book is selected - Implemented
- Notes appearing outside of note box - Implemented
- Shelf sorting functions – Implemented, not fully functional
- Integration with traditional search results page – Implemented, not fully functional
- Saving and sharing shelves – Implemented, not fully functional
- Adding post-it to book spine indicating that book has been annotated - Implemented
- Truncating titles in tooltips – Implemented

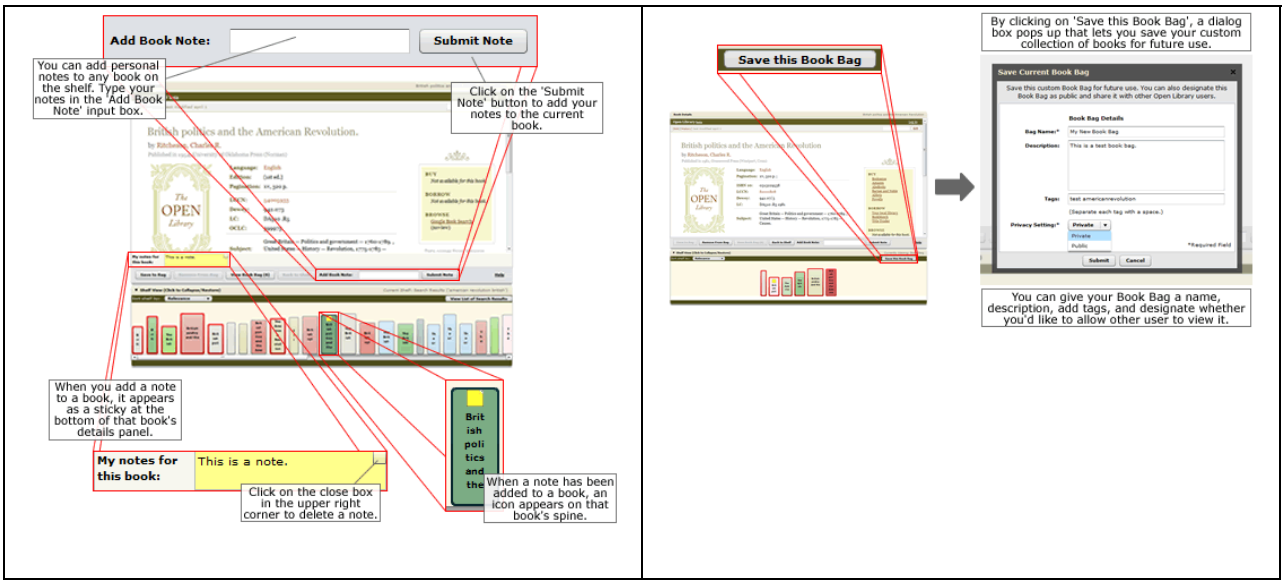
Next steps:

- Keep working to improve titles and spines
- Tag-like suggestions for notes
- Annotating multiple books at a time
- Transparency of tooltips
- Adjustable panes
- Books being viewed given open-book icons
- Drag and drop functionality
- Note pad

The following is a link to functional version of our revised prototype: http://people.ischool.berkeley.edu/~breity/OLShelfView/bin-debug/OLShelfView_arb_search.html. Sample figures outlining a few of the features of the revised prototype are below.

Figure 2. Revised prototype sample modifications.





Further Discussion

Extremely important to note is that we could not test one of the main functions of our prototype. The original goal of the prototype was to show a book in context in the real context it would appear in a library, namely situated within the collection as a whole. However, due the data constraints this was not possible. This would have required live access to the Open Library backend as a whole, which was not possible at the time of testing. As such we had to settle for testing the virtual shelf as a tool for visualizing search results. The mitigating factor to this potentially large issue, is that we are more certain of the value of the Virtual Shelf as a tool for this purpose, if for no other reason than there is really no other system providing this function. Whether the Virtual shelf would have value as a tool for visualizing search results was less certain and we were able to test using existing systems as a control.

An interesting phenomenon that occurred during testing was that a few users were very worried about the books chosen for the purposes of the test. For our purposes the books themselves were not actually relevant, however, users were not told this. This level of care tended to raise their testing times, but showed they were invested in the tasks, helpful for good design testing.

Finally, it is important to keep in mind that we are not claiming generalizability for our study. While we were able to test with a spectrum of user experience levels, these users were collected from a convenience sample. College students and other high level users are disproportionally represented. While this does not make the claims they raise any less valid, we are aware that there are limitations on the voices we heard.

Conclusion/Next Steps

We believe that these results are sufficient to prove there is value to this visualization. All users were able to quickly learn the features in under a half hour of use. Many users identified the ability to process search results without clicking back and forth as a legitimate need. Finally, a substantial majority of users identified the virtual shelf as a technology that they think would improve their library experience.

Despite this, the project is far from finished. Next steps will include further testing and design iterations. We are not completely satisfied with the testing procedure surrounding absorption of surrounding books, and would like more information on how our visualization can mesh with traditional search results systems, as well as feedback on whether the design changes we have implemented fully address the user concerns that prompted them. Also, we will be seeking to test and integrate the myriad of suggestions we received over the course of the study. In addition, we believe that testing with live data will be extremely important. Once the Open Library has their API fully up and running, we will be able to test the functionality of the general shelf, the original planned use of the visualization.

We will also make it a goal to continue testing and refining the visual properties of the shelf. Improving the titles will be the first focus, as well as exploring other ways to use color. Some suggestions we are considering include using color gradation for relevance when viewing search results, brightness for popularity, or even dynamically generating persistent patterns for the spines, similar to the sort of system used to create backgrounds for password filters.

Appendix: Testing Materials

Pseudonym for this Participant:_____

Virtual Shelf Usability Study Participant Release Form

Thank you for your willingness to participate our study of the usability of our Virtual Shelf prototype. During these three weeks, we are conducting usability testing with high-school, college age, and post college users, to assist us in identifying the strengths and weakness of our latest prototype. Such research may help us understand how to make digital libraries better serve their users.

Your agreed participation consists of completing one or more sets of tasks during a tester observed procedure. Between tasks, we will ask you to complete a short survey on the prototype's effectiveness. The information that we gather from you will be kept in a research archive. We will use a pseudonym to protect your identity. Your real name will be kept confidential.

We do not intend to share personal information collected with anyone not involved in this research. However, we may want to show or use specific parts of our data in research presentations or publications—perhaps at conferences, in university classrooms, in books, or with companies and organizations with whom we collaborate. In all cases, your name will be kept confidential.

During our interview, feel free to inform us if you wish to clarify any prior statements made or if you wish certain sensitive and/or potentially identifying information not to appear in published form. Furthermore, in order for us to protect your ideas, please do not discuss with us any of your personal plans, inventions, or patents which you feel you may pursue in the future, or to which you may not want us to have access.

If you have questions or concerns about this permission form or about your rights as a participant, contact Devin Blong (707 478-5654, d_blong@ischool.berkeley.edu) or Jonathan Breitbart (510 848 5982, breity@berkeley.edu)

By signing this form, you agree that:

- You have read and understood it, and agree to its conditions;
- Your participation in this study is completely voluntary and you may quit at any time;
- You have the right to not answer any question with which you feel uncomfortable;
- Your name and the name of any identifying features will be kept confidential;
- Your responses to interview questions may possibly be quoted and included in future research publications and/or presentations;
- You will keep a blank copy of this form for your records;
- You are over the age of 18 and considered an adult under the law

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Signature (of respondent) Name Printed Clearly Date

Demographic Survey

When is that last time you had to do any research?

What was the subject?

How did you find the resources you were looking for during this instance? Check all that apply

Visit the library

---Title Search
---Author Search
---Subject Keyword Search
---Subject chaining/browsing subject headings
---Shelf Browsing
---Asking a Librarian
--Other library resources (article databases, etc.)

Online library systems from outside the library

---Title Search
---Author Search
---Subject Keyword Search
---Subject chaining/browsing subject headings
---Shelf Browsing
---Asking a Librarian
--Other library resources (article databases, etc.)

Online search engines

---Keyword search engines (e.g. google)
---Online book or article collections (e.g. google Scholar)

When was the last time you checked a book out from the library? (circle one)

This week This month This year Not this year

How often do you use perform online searches using engines like Google, Ask, Yahoo to do research? (circle one)

Never Rarely Sometimes Frequently Daily

Are you familiar with any of the advanced features of online search, such as syntax, filters, languages, results preferences? If so, please list features you most frequently use.

TEST SCRIPT

"Welcome to the Virtual Shelf and thank you for volunteering to help test our prototype. We have a few tasks we would like to run through with you today, and after each, there will be a short survey. While performing the tasks we would appreciate it if you would think aloud; describing what you are doing, the decisions you are making, and any confusion you are encountering."

Group 1 test plan

- Utilizing shelf functions
    - Survey 1
- Absorbing relevant results (V. Shelf basic)
    - Survey 2
- Visualizing Search Results Control
    - Survey 3
- Absorbing relevant results (Control)
- Learning effects
    - Survey 5

Group 2 Test Plan

- Utilizing shelf functions
    - Survey 1
- Absorbing relevant results (V. Shelf basic)
    - Survey 2
- Visualizing user created collections (Control)
    - Survey 4
- Absorbing relevant results (Control)
- Aesthetics Test
    - Survey 6

(Group 1+2) Utilizing shelf access functions

"This is the virtual shelf. For the first task we would like you to imagine that you are researching the British perspective on the American Revolution. You have searched the Open Library for the keywords 'American Revolution British' and then chosen to view the results as a single shelf. Please find four books that you think would be useful to your project, record their LC call numbers, add the note "AR project" to the listing, and add them to the book bag.

Tester notes: Time this process from the time you finish the script to the end of the task. Please take note of any difficulties users have while performing this task and do not provide instructions unless they are truly stuck and getting frustrated.

(Groups 1+2) Absorbing relevant books

"Without looking back at the shelf, can you please tell us everything you remember about the books you have selected or other books nearby."

One of the theories that we would like to test is whether the induced serendipity of accessing the shelf as well as the visual components of the design will increase retention of surrounding and related books. After users conduct the

above test, they will be asked the list without looking what they remember about the surrounding materials. How much they remember will be noted.

(Group 1)Visualizing search results(Control)

"Now you are looking at the results for "American Revolution women" in the traditional Open Library search. Please find and write down the titles and LC call numbers of four books in the first 60 results that you think would be useful for a paper explaining the role of women in the American Revolution. In case the LC call number is not available record that it is not available."

(Groups 1) Absorbing relevant books (Control)

"Without looking back at the screen, can you please tell us everything you remember about the books you have selected or other books nearby."

(Group 1)Learning effects test

"This is the result set for American Revolution French. Please find five books that you think would be useful to a project examining the French perspective on the American Revolution, record their LC call numbers and add the note "AR project" to the listing."

Tester notes: Time this process from the time you finish the script to the end of the task. Also, take note of clicking patterns, whether they are using tooltips, and hesitations.

(Group 2)Visualizing a collection of books that you have created (Control)

"Imagine that you are researching the role of women in the American Revolution. These are the results for a search on American Revolution Women in the pathfinder system. Please find 4 books that you would consider useful for your paper, and save their records. Then please view your saved records"

(Group 2) Visual cues effects test

"This is the result set for American Revolution French. Please find four books that you think would be useful to a project examining the French perspective on the American Revolution, record their LC call numbers, and add the note "AR project" to the listing."

Tester notes: Time this process from the time you finish the script to the end of the task. Also, take note of clicking patterns, whether they are using tooltips, and hesitations.

Exit interview

"Thank you for participating in our study. Do you have any miscellaneous suggestions for either the visualization or the testing procedure?"

Task surveys

1. Utilizing shelf access functions

Participant Pseudonym_____

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

1: The features of the shelf aided my ability to deliver on the requested task.

1 2 3 4 5

2: Having the books change size during the mouseover was helpful

1 2 3 4 5

3: Did any functions cause confusion? If so, which ones and why?

4: Were there any functions that need better labeling and instructions for usage?

2. Absorbing relevant books

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

1: I am able to remember other books near the book I searched for, not exact text but physical features i.e. Height, width

1 2 3 4 5

2: The different sizing of book spines helped me visually separate the books.

1 2 3 4 5

4: Did you feel that the tooltips on the book spines provided information effectively?

5: Is there any additional information you would like to see included in the tooltips? Is there anything you would like removed?

3. Visualize search results

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

1: I was able to find what I was looking for more quickly using the shelf format than text search results.

1 2 3 4 5

2: It was easy to scroll through the list of search results on the shelf.

1 2 3 4 5

3: I am able to answer the stated questions more quickly by opening up books on the shelf than clicking on search result text links.

1 2 3 4 5

4: In terms of navigation, how do you like being able to scroll indefinitely through your search results vs. the broken down pages of results (with 10 results per screen)?

5: How often did you click on books as you scrolled through the search results on the shelf as opposed to just using the tooltips?

4. Visualizing a collection of books that you have created

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

1: I feel it is important to be able to save the records of materials that I find useful.

1 2 3 4 5

2: I would like to be able to share custom collections I create with friends or colleagues.

1 2 3 4 5

3: I would be interested in being able to create and label multiple custom collections.

1 2 3 4 5

4: I would be more likely to share or re-use collections I have created if they are visually presented than if they are a list of text links.

1 2 3 4 5

5: Why or why not?

5. Learning Effects

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

1: I feel that the virtual shelf was easier to use this time around.

1 2 3 4 5

2: I understand all the features of the virtual shelf

1 2 3 4 5

3: Overall, I feel the virtual self would improve my experience in an online library setting

1 2 3 4 5

6. Aesthetics Changes

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

1: I feel that the virtual shelf was easier to use this time around.

1 2 3 4 5

2: Having pieces of the titles on the spines made it easier to identify the books

1 2 3 4 5

3: Color coding made the books easier to remember and differentiate

1 2 3 4 5

4: Without looking at the shelf, are you able to remember more about the books on the shelf than in the colorless version?