



Columbia University Libraries / Information Services
Digital Library Collections (Beta)

Cognitive Walkthrough Evaluation

by Michael Benowitz

Pratt Institute, School of Library and Information Science

Executive Summary

The Beta launch of the Columbia University Digital Library Collections (DLC) website, designed to be a central repository of items created through the various digital projects of the Columbia libraries and academic departments, provides a unique opportunity to improve access these projects. The DLC already provides access to a large and growing collection, quickly and easily guiding users through their searches. Further testing at this early stage of deployment has revealed several means of further improvement and the suggested edits here should help cement the DLC's central role in Columbia's digital humanities work.

A Cognitive Walkthrough, in which a group of usability experts conducted several model user tasks in the DLC, was undertaken to evaluate the functionality of the DLC and to recommend possible improvements to the site. The expert group, executing two tasks typical to new users of the DLC, found several areas which could be improved. Following this evaluation, the group was able to make several recommendations based on these findings. These recommended changes include:

- Updating the language used to describe the actions available on the main Projects homepage.
- Considering alterations to the "Format" tab to allow for grouping and filtering of multiple formats
- Changing the display and supporting text of the "Year" function.
- Moving and altering the options through which users can organize their results.

The DLC site provides a valuable service to the Columbia Libraries and the large audience they serve. As the DLC is replacing a system of independent project pages, care must be taken in its design for it to be immediately appealing and engaging, or it risks losing users to these independent pages. With this in mind, this usability report was undertaken with the goal of identifying ways the DLC can better achieve these goals.

Table of Contents

Introduction	1
Methodology	2
Findings & Recommendations	3
Landing Page Recommendations	3
Project Page Recommendations	5
Appendix	8
Task 1	8
Task 2	9
References	10

Introduction

The DLC offers users a new way to browse and search Columbia's digital projects. Bringing together thousands of items in several dozen formats, the DLC site provides a very useful tool for any researcher looking to locate items in the collections of the University Libraries. By allowing them to search across collections, similar to how a union catalog allows patrons to browse items from multiple libraries, the site enables users to gain more information through their queries and depart with greater confidence that their search has been exhaustive.

As the site has been launched in Beta form, there is ample opportunity to refine its functionality and the tools that it offers to its users. These intended users are researchers who are likely largely unfamiliar with these collections, and therefore providing a wide range of tools and easy access to the collections is of paramount importance for the DLC. This report is intended to examine several improvements that could improve the speed and ease of use of the site.

This evaluation was undertaken with a close eye to Donald Norman's concept of visceral design, focusing on the immediate reaction aroused in users (Norman, 2005, p. 65). Ease of use plays a major role in generating this reaction as a website with an immediately understandable and navigable design can generate a strongly positive emotion for users. This report focuses on what this visceral response to the DLC may be and several recommendations for improvements that stem from this reaction.

Methodology

These recommendations are the result of analysis created through the Cognitive Walkthrough method first devised in the 1990s (Wharton, Rieman, Lewis, & Polson, 1994). This method focuses on evaluating how a novice may navigate and use a website, providing insight into that site's ease of use. The method assumes that a novice will learn in an exploratory way, selecting menu options and other features until they find a match with their intended action. While this assumption is a large one, it is instructive as we cannot assume that users will have any type of support structure or will think to look for guides on use of the site. Further, it is important to understand user's visceral reaction to the design of the DLC. This reaction, the immediate emotion that it arouses in users, will be key to attracting repeat visitors and encouraging the DLC's intended audience to use this system in place of the existing project sites and the Columbia Libraries Information Online (CLIO) catalog.

The analysis of a cognitive walkthrough is carried out by a group, led by a moderator, which explores several tasks on the site. Each task is broken down into concrete steps that must be taken by a user and explored sequentially, with the group seeking to answer the following four questions:

- Will users attempt to take the correct action?
- Will users be able to locate the item that provides this action?
- Will users be able to use the system to achieve this action?
- Once performed, will users see that the action has brought them closer to their goal?

For analysis of the DLC site, two tasks were selected as inputs for this method, both focusing on locating selections of items through the DLC. This selection is an intentional focus on unknown item searches, which are a key way in which users will be accessing this site. While researchers who are familiar with a collection and have a known item they are seeking are likely to use individual project websites they are familiar with, the DLC serves as a portal for any user unfamiliar with the Columbia Library collections and who is seeking to explore that content. The two tasks selected are:

Task 1: Locate letters written by John Jay in 1800

- 1) Click "Browse Content" under *Papers of John Jay*
- 2) Click "Year"
- 3) Enter "1800" in both "YYYY" boxes.
- 4) Click "Set"

Task 2: View all illustrations on the site and sort them alphabetically

- 1) Select "Format" tab
- 2) Select "Illustrations" from list
- 3) Click the "<->AZ" button
- 4) Select "Title" from dropdown menu

The findings of this analysis will be interpreted largely through the design precepts set forth by Donald Norman in his landmark exploration of design *The Design of Everyday Things* (Norman, 1988). Norman's concepts help inform the visibility of site functions the feedback they provide to user actions, what types of action they afford or constrain and other factors that define how users will experience the site.

Findings & Recommendations

Summary

Overall, the cognitive walkthrough that was conducted found a cohesive and intuitive design implemented for the Columbia DLC. The homepage, the collection pages and the item pages all provide a clean and well designed system for exploring a highly complex and varied set of documents. With this wealth of information it is key that the DLC provide a fast and intuitive method for narrowing the number of items presented to users. Indeed, in a sentence, this is perhaps the sole function of the DLC. In this regard there are several improvements that could make the DLC a more intuitive and understandable access point for Columbia's digital collections.

Homepage Recommendations

The DLC homepage, dlc.library.columbia.edu, immediately presents a brief introduction before simply displaying the content of its component projects, of which there are currently 60. This accurately represents the scope of the collection and provides an easily navigable structure that is sorted alphabetically. However, our testing found that the risk exists that content could become lost in the midst of this page.

We recommend that several changes be made to the "Projects" and "Formats" tabs. We found that users could possibly be unsure of the materials presented in both locations. As researchers will generally be visiting with the goal of narrowing their search to the proper projects, formats and times, the site should present clear choices. To reduce ambiguity and users' search time, we would make the following suggestions.

Change the title of the "Projects" tab to "All Projects."

- The current term is potentially unclear as the homepages of similar institutions only include highlighted projects. With no further explanation it is unclear if this page does or does not include all of the DLC projects.
- This will indicate that users have the broadest possible view, inviting them to further narrow their results.

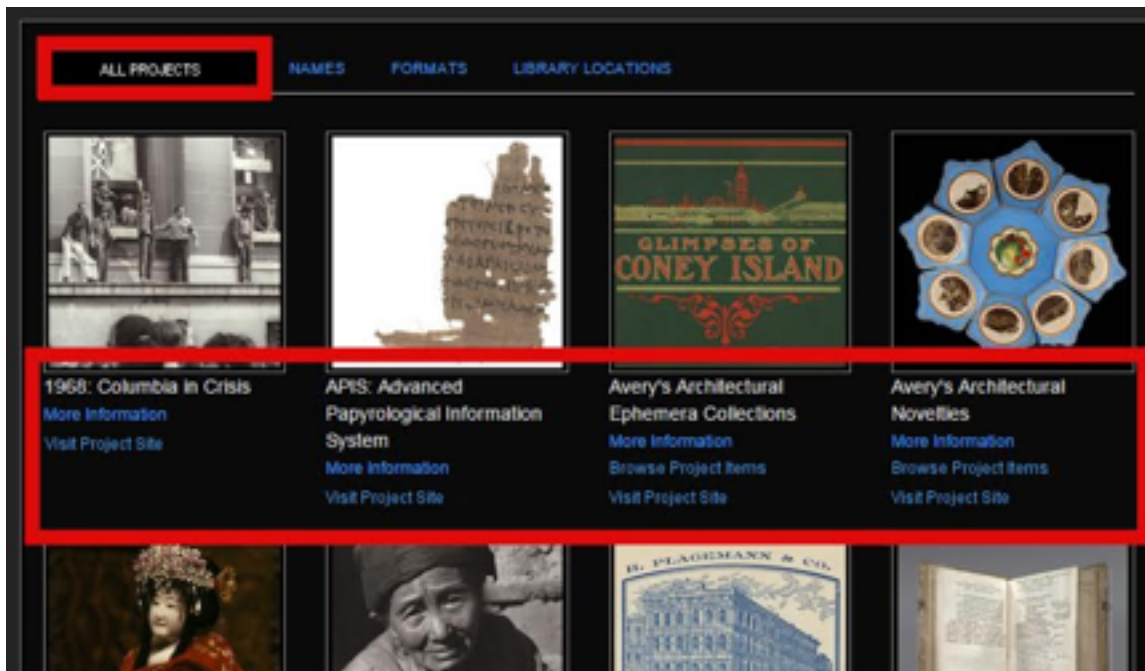
Alter the hyperlinks under each project from their current language to "More Information / Browse Project Items / Visit Project Site."

- The "Browse Content" and "View Project Site" links are potentially unclear, particularly for novice users who are not familiar with the DLC and its relation to the individual project websites.
- Inserting the "Visit" term should more clearly indicate that users will be leaving the DLC for an outside page.
- Inserting "Items" into the browse link will also more clearly indicate that link's function.

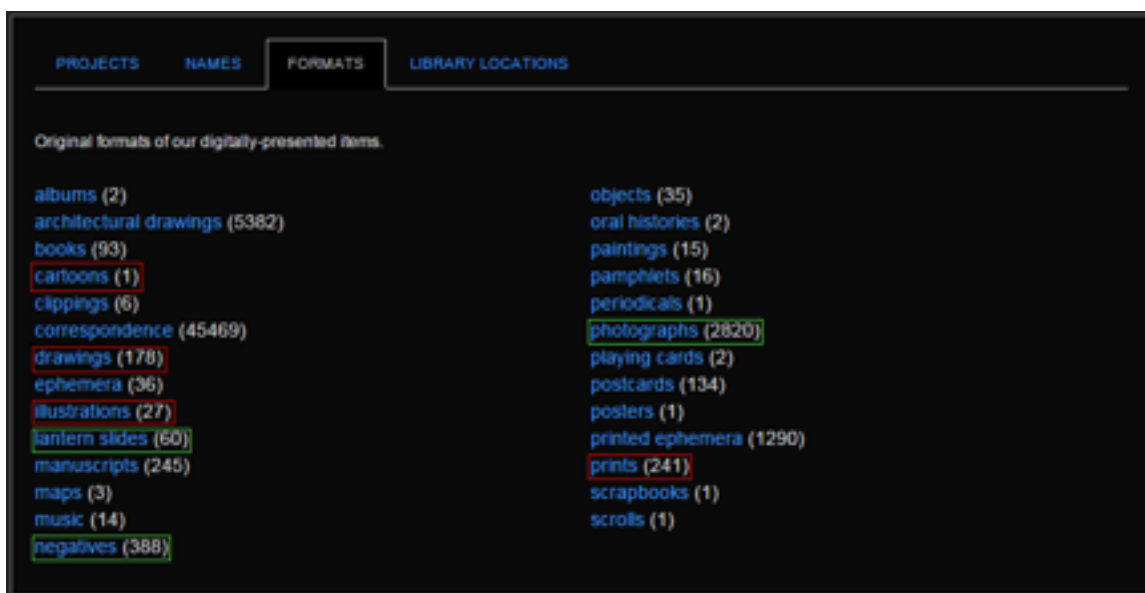
Explore a method that would enable users to select multiple options in the "Formats" tab.

- This table is immediately understandable, but users are restricted to selecting one format by which to filter.

- Several formats, including “Illustrations” and “Drawings” are very similar and could cause frustration for users who would like to view these formats together.
- Allowing users to select and combine several formats would allow users to return custom results tailored to their needs.
- This could function either through the creation of predetermined consolidated format categories or through the creation of a feature for creating custom categories.



Projects Tab with recommended changes highlighted in red.



Format Tab with similar formats grouped by colored boxes.

With users simply beginning their searches from the DLC homepage it is essential that they be able to quickly proceed to individual projects and other more specific collections. Currently the page clearly depicts the full range of actions afforded and with the above changes we feel it will become an even faster tool for resource location.

Project Page Recommendations

When users select a project, either through the browse or search functionality of the homepage, they are presented with a wide range of options for further refining and organizing the items being presented to them. The page clearly presents these items, displaying large thumbnail images and titles for all of the items. However, some potential issues were found that could prevent users from achieving their goals for specific tasks within this system.

We would recommend several changes to the option to refine and organize their search results. These changes are largely concerned with the visibility of these tools and how what is visible impacts users' understanding of how these tools operate. The following changes should be considered to achieve these improvements.

Rename the “Year” filter tool to “Date Range”

- The current title does not reflect this function, which filters options based on a user defined range of years.
- The new term provides better instructions on what users may do with this tool.

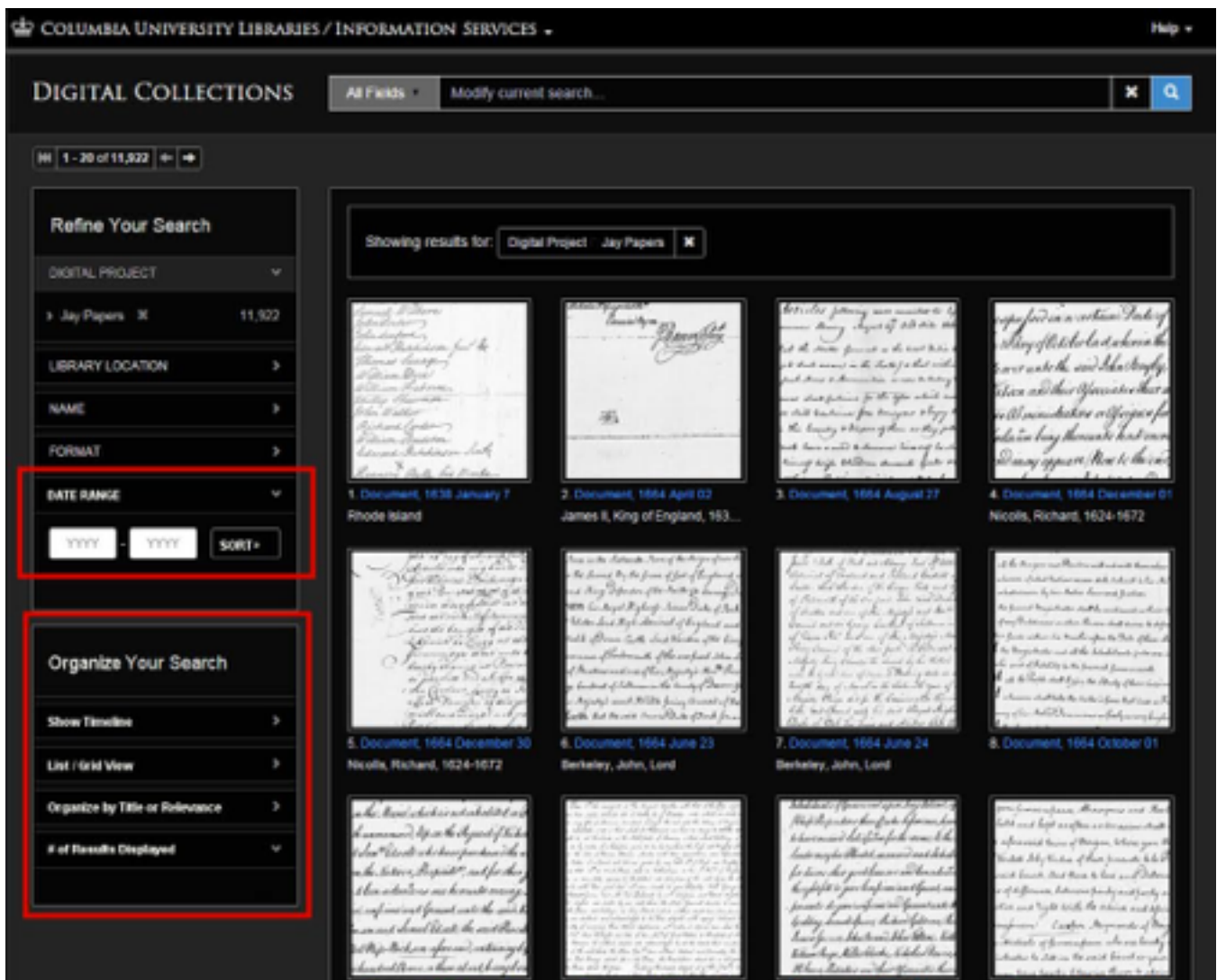
Make the second “YYYY” box optional or add supporting text to inform users of how to display items from only one year

- Users may have difficulty recalling the details of how this tool works as it is a unique function on the site. Functions that are unique or conflict with other functions will be difficult for users to remember. (Norman, 2002, p. 72)
- It is currently ambiguous if the tool is inclusive or exclusive in how it handles filtering by year. Supporting text would relieve users of the burden of having to remember this fact.
- Making the second box optional would clearly indicate the possibility of filtering by one year.

Rename the “Set” to “Sort,” or similar term.

- “Set” is an uncommon term that does not immediately communicate its function to novice users.
- “Sort” and other terms more closely match the function of the tool and more quickly communicate the intended action.

We would also recommend several changes to the organizational features provided through this page. Currently located in the top right corner of the page in a series of small symbolic buttons, these functions can be overlooked and overshadowed by the major “Refine Your Search” options in the left column of the page body. By locating the two major functions of this page in separate locations, the page asks users to recall where individual functions are located. We therefore recommend that:



Columbia DLC Project Page with recommended changes highlighted in red

The organizational functions be moved to the left hand column to a box titled “Organize Your Search”

- The current location of the buttons can be overlooked by novice users.
- Their function is not made apparent until users hover or otherwise interact with the buttons.
- This would locate all possible actions on the page in a single column in a highly visible place on the page.
- The “Organize Your Search” clearly indicates the actions provided by these tools.

Replace action symbols with text phrases

- The current symbols represent actions but may not be immediately understandable to new users
- Labelling actions with clear text will be immediately understandable to novice users and still allow returning visitors to quickly navigate the system

Unify functionality and styling of “Organize Your Search” buttons

- Currently organize functions operate either through a choice of two buttons or a dropdown. This requires users to recall how each function operates.
- Providing a single method of interaction would help users organize items more quickly
- Matching styling with the “Refine Your Search” tools would clearly indicate to users that they can interact with all functions on the page with the same methods.

Sorting and refining these results are key functions for a system, particularly for users who are looking to narrow their search results as far as possible, minimizing the number of extraneous documents they will have to view to find the information they are seeking. We feel that these changes will allow them to do so quickly and accurately.

Conclusion

The DLC presents users a large number of detailed images, documents and other materials. New users will be focused on understanding this content and will look for functions that can quickly and logically sort and filter their items in a way that is immediately perceptible and understandable. With an active display window that sorts results in real time the DLC is a powerful tool for this and can be made more intuitive with the implementation of these recommendations. Altering phrases and terminology to more familiar terms and grouping functions together simply improve the usability of an already useful tool.

TASK 1: Locate letters written by John Jay in 1800.

Step 1: Click “Browse Content” under *Papers of John Jay*
Failure Story, User may not be able to locate the correct action

Arriving at the homepage of the Columbia DLC users are confronted with a wide range of options. When searching for a specific collection it may not immediately be obvious that all collections are available on the homepage or that they are organized alphabetically. Further, the three links included under the collections can be misunderstood. Particularly “Browse Content” and “View Project Site” might offer a false choice to the user.

Step 2: Click “Year”
Success Story

The option to narrow the content viewed by year is easily accessible through the “Refine your Search” area on the main collection page. This places the option in a highly visible location while locating it logically with the other affordances made possible by the system. The arrow at the right edge of the box clearly indicates the possible interaction and a highlight feature on mouseover provides feedback to users as to the correct action.

Step 3: Enter “1800” in both “YYYY” boxes.
Failure Story, Users will be unsure of how to use the feature

While users are presented with a clear action prompt and the design clearly provides an affordance for filtering based on a span of years, the system image does not match users’ conceptual model of the operation. To filter for a single year, the same year must be entered in both boxes. The inclusive way in which the tool filters the collection is not made visible, causing confusion on the part of the users.

Step 4: Click “Set”
Failure Story, Users are not provided adequate feedback

Once a user takes the action to refine the document list, the page clearly refreshes, indicating that their action has had an effect. However, the search results begin with a set of undated documents, leaving the true result of the user’s action unclear. Further, the language choice of “Set” is slightly ambiguous and does not exactly match the action being taken.

TASK 2: View all illustrations in the collections and sort them alphabetically

Step 1: Select “Format” tab

Success Story

The tab is clearly labeled and positioned in a logical location along with the other main navigation options. The design of the button also clearly indicates the function of opening a new tab on the page, which is closely mirrored in the feedback users receive when selecting this option.

Step 2: Select “Illustrations” from list

Success Story

Users are presented with a clear list of formats, arranged in alphabetical order. The styling of the list clearly indicates the tabs usability as a navigation function and provides the number of items that can be found by selecting each option. Once selected, the page loaded clearly displays the items the user was seeking, with a set of illustrations that match the expectations of an “illustration” search. However, some doubt was expressed as to if this term and collection encompassed all of the desired items, with several other possible visual formats appearing in close proximity to "Illustrations."

Step 3: Click the “<->AZ” button

Failure Story: Users may not notice that the option is available

When a user attempts to sort their results they may not notice that the system includes a separate set of controls for how content is displayed, different from the options in the “Refine Your Search” area. This could lead to confusion on the part of users who cannot locate the small buttons that control these functions. The button text, while descriptive, is also hard to read, further increasing the chance that users will overlook the option. When hovered, the button highlights in a clear fashion, indicating further options and when clicked the appearance of a dropdown clearly demonstrates the next task.

Step 4: Select “Title” from dropdown menu

Success Story

The dropdown presents only two options: relevance and title, with the currently selected option marked with a checkmark. While the term “Title” does not exactly match the concept of alphabetization, users can quickly determine the action to be taken. Once an option is selected, the page reloads and the organization is clear to users, with items matching the principle selected.

References

Wharton, C., Rieman, J., Lewis, C. & Polson, P. (1994). *The Cognitive Walkthrough Method: A Practitioner's Guide* (ICS Technical Report #CU-ICS-93-07) Boulder, CO: University of Colorado at Boulder

Norman, D. (2002). *The Design of Everyday Things* (2nd ed.). New York: Basic Books.

Norman, D. (2005). *Emotional Design: Why We Love (or hate) Everyday Things*. New York: Basic Books.