

HathiTrust Mobile: A Heuristic Analysis

SI622 001 Group 5 – Kate Davies, Kyle Donnellon, Melody Ku, JP Obley

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Executive Summary

For this study, we evaluated the HathiTrust Mobile website according to a set of usability heuristics originally developed by Jakob Nielsen (1994). For the first stage of the study, each team member conducted an independent heuristic evaluation using his or her personal mobile device: an iPhone 4, an iPod Touch, an iPad 2 and an HTC G2 mobile phone. Each team member identified issues that arose during his or her use of the website that violated one or more of Nielsen's principles, and gave each issue a severity rating based upon how much it impacted use of the website.

During the second stage of the study, the team came together and shared each member's evaluation results with one another. We identified issues that were recurring and/or most severe, and created a spreadsheet containing these issues. Each team member independently assigned each issue with a severity rating, and these were averaged to come up with the final rating. From this spreadsheet, we identified the following key findings and recommendations:

Key Findings

- There is a lack of customization and collection accessibility.
- The PageTurner menu is not optimized for use on mobile devices.
- HathiTrust Mobile is unable to deliver documents in EPUB format.
- Zooming capabilities in PageTurner restrict the reading experience.
- The filtering system on HathiTrust Mobile is inefficient.
- HathiTrust Mobile is incompatible with the HTC T-Mobile G2 device.

Recommendations

- Add a collections feature to HathiTrust Mobile.
- Expand the screen area that users can touch to pull up the PageTurner menu.
- Reconfigure the PageTurner menu to retract automatically after a period of disuse.
- Add a link to the "Help" page from the PageTurner menu.
- Investigate the problem with EPUB documents. If HathiTrust Mobile cannot deliver EPUB documents for some time, remove the option to download EPUB documents from the system.
- Rewrite error messages to be more helpful to users.
- Make zooming more fluid on PageTurner, or consider using a reading application that allows for this capability.
- Encourage users to view documents in plain text.
- Make the filtering parallel and matrix style, not linear.
- Make selected filters viewable from the search results screen.
- Conduct broader testing of HathiTrust Mobile across devices, systems and networks.

We believe that these recommendations, if implemented, would greatly improve the searching, browsing and reading experience for HathiTrust Mobile users.

Introduction

The system we are evaluating is HathiTrust Mobile (<http://m.hathitrust.org/>), the mobile web application for HathiTrust Digital Library (<http://www.hathitrust.org/>), a large-scale repository of digitized content from the collections of major research libraries and institutions. HathiTrust is a collaborative effort of more than 60 contributing institutions that is dedicated to securely preserving human knowledge for use both today and in the future.

HathiTrust Mobile, specifically, is a version of the HathiTrust Digital Library website optimized for use on mobile devices. A project of the University of Michigan Library UX Department, HathiTrust Mobile focuses on the catalog search and full-text reading (referred to as PageTurner) functions of the main site. It also allows users associated with its partner institutions to download full-text materials in PDF or EPUB formats. Because the mobile application is web-based, it is intended to be accessible across all platforms and from mobile devices, such as phones and tablets, as well as laptops and desktops.

HathiTrust Mobile launched in the fall of 2011. However, the staff of the UX Department was unable to test the site as extensively as they would have liked, and are consistently finding bugs. The goals of our project are to identify and remove additional bugs, recommend design ideas to improve the site's current navigation, and gauge how well users are being served by the site.

The current users of the HathiTrust regular site are largely academics—librarians, professors, students and researchers—as well as hobbyists interested in topics ranging from genealogy to boat restoration. Although the user base for the mobile site is less clear, HathiTrust Mobile is not designed for researchers as it lacks the full-text search function of the regular site; its users are likely members of the general public who are interested in reading digitized content from a mobile device.

As this study is a part of a larger usability research project of HathiTrust, its premise is to examine usability and design in a timely and low-cost manner—a heuristic evaluation. We adopted 9 out of 10 of Nielsen's (1994) heuristics to evaluate how well the HathiTrust Mobile site adheres to its best practices and identify areas for improvement. We did not include Nielsen's "Error Prevention" heuristic in our evaluation criteria because we felt that it was not applicable in light of HathiTrust Mobile's basic functionality, which allows users to search for, read and download digitized documents. To help focus our evaluation, we agreed on a short list of questions that we would attempt to answer for each heuristic (for a list of the 9 heuristics and their associated evaluation questions, see Appendix A). We assigned severity ratings for each heuristic violation, which helped us prioritize the issues our inspection revealed and develop design ideas and recommendations for improvement.

Methods

We evaluated HathiTrust Mobile using the method of heuristic evaluation. In a heuristic evaluation, a system is inspected by a group of usability specialists according to pre-established usability principles, or heuristics. Typically individual evaluators inspect the system for usability issues first, then compare and synthesize their findings and prioritize key findings.

Heuristics

In conducting our evaluation, we used Jakob Nielsen's usability principles (Nielsen and Mack, 1994). After considering the 10 usability principles in relation to our project, we decided to use 9 of the usability principles to evaluate HathiTrust mobile. A list of the heuristics we used and the questions we used to evaluate the site's performance according to each heuristic are listed in Appendix A.

Individual Evaluations

Before beginning the heuristic evaluation, we developed a template for individual evaluators to use and a rating system with a 5-point severity scale (for a list of severity ratings and their explanations, see Appendix B). We decided to evaluate all of HathiTrust Mobile's pages and functions, since they all fall within the scope of our project. We also discussed how each heuristic would be interpreted in the context of HathiTrust Mobile.

Each group member completed an individual evaluation of the HathiTrust Mobile site according to the 9 heuristics we chose to use and listed the issues they found in the heuristic evaluation template along with a description of the issue and a severity rating. In evaluating the site, each group member used a different mobile device so that we could get a sense of HathiTrust Mobile's functionality across devices and operating systems (for a complete list of the devices each group member used for individual evaluations, see Appendix C).

Group Evaluation and Prioritization of Issues

After each group member had completed their individual evaluations, we met as a group to discuss the issues we had identified. During the discussion, we combined similar or repeated issues and gave each group member a chance to explain the issues he or she found to the rest of the group. We input the violations of each heuristic into the heuristic evaluation template and assigned each a severity rating. To determine group severity ratings, we had each group member rate the issue individually, then took an average of the individual ratings (see Appendix D for the group violations and rankings). We grouped the heuristic violations based on what part of the HathiTrust mobile system they concerned and developed recommendations for improvement for the most severe violations.

Findings and Recommendations

FINDING 1: There is a lack of customization and collection accessibility.

Violations: User Control and Freedom; Flexibility and Efficiency of Use; Recognition Rather Than Recall

Users are not able to save searches, nor access or establish their collections using HathiTrust Mobile. There is no individual personal collection feature for users. This means that users cannot save documents to their HathiTrust accounts; instead, if users want to revisit content, they must go back to search and retrieve the desired material every time. There is no record of previous searches, hence they have to remember what searches they performed to obtain the material, making this a very cumbersome process. This is particularly the case if they amass a large collection of material. There is no collections feature on HathiTrust Mobile, nor any way to access the collections feature that is available on the regular site using Mobile.

RECOMMENDATION 1: Add a collections feature to HathiTrust Mobile.

This will provide accessibility to the regular site for users who have established a collection and for those who wish to start one from the mobile site. It will also eliminate the aforementioned problems of re-entering the search criteria for desired materials. It further maintains a record for the users so they do not forget what they searched for, allowing them to better manage their content.

FINDING 2: The PageTurner menu is not optimized for use on mobile devices.

As noted above, “PageTurner” refers to the reading function of HathiTrust mobile, where users can read full-text documents either in PDF or plain text formats. The PageTurner menu displays the options users can choose from the PageTurner screen, including reading format; information about the document; settings; “Get Book,” which gives logged-in users the options of downloading the e-book in PDF or EPUB format or locating a hard copy in a library; and searching inside the book (see Figure 1). During our heuristic evaluation, we found that the PageTurner menu is not optimized for use on mobile devices for three distinct reasons, which are listed below.



Figure 1 - PageTurner menu, open.

The PageTurner menu is only accessible from a small button in the corner of the screen.

Violation: Flexibility and Efficiency of Use

It is necessary for users to open and close the PageTurner menu frequently, because when it is open it takes up a large portion of the screen that users are reading. However, to open and close the PageTurner menu, we found that users must tap a small gray box with an arrow (see Figure 2) that is located in the bottom left-hand corner of the screen. This violates the “Flexibility and Efficiency of Use” heuristic because it forces users to locate and tap a small,

out-of-the-way target, which decreases the efficiency of completing tasks from the PageTurner menu and increases the likelihood that users will miss the target when attempting to pull up the PageTurner menu.

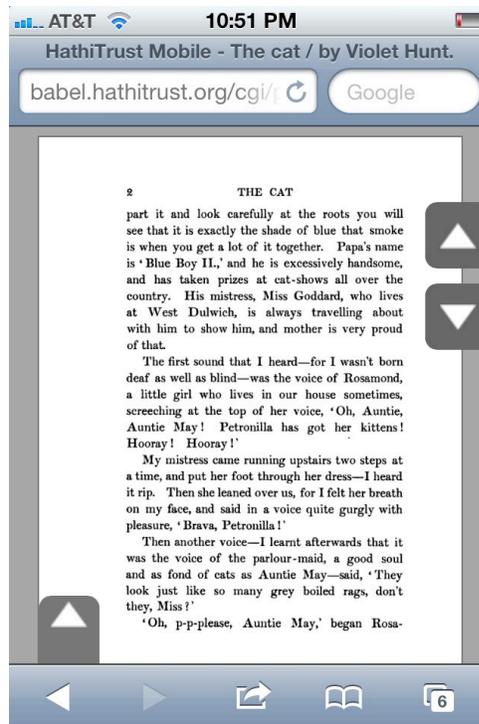


Figure 2 - PageTurner menu, closed.

RECOMMENDATION 2A: Expand the area that users can touch to pull up the PageTurner menu.

To improve the efficiency of use of the PageTurner menu, we recommend that HathiTrust Mobile expand the screen area that users can touch to pull up the PageTurner menu. This will allow users to open and close the PageTurner menu more quickly and decrease the likelihood that users will miss the target when attempting to pull up the PageTurner menu. While it may not be optimal for users to be able to pull up the PageTurner menu by tapping anywhere on the screen, the target area should be expanded to contain the bottom left quadrant of the screen.

The PageTurner menu does not retract automatically.

Violation: Aesthetics and Minimalist Design

As previously mentioned, the PageTurner menu takes up a significant amount of screen real estate when it is open. Additionally, we found during our heuristic evaluation that once the PageTurner menu is open, it remains open until a user closes the menu by tapping a small box with an arrow icon in the bottom left-hand corner of the screen. This violates the “Aesthetics and Minimalist Design” heuristic because it crowds the screen with excess icons and other graphic elements.

RECOMMENDATION 2B: Reconfigure the PageTurner menu to retract automatically after a period of disuse.

We recommend that HathiTrust Mobile reconfigure the PageTurner menu to retract automatically after a specified period so that users can continue reading unimpeded. This will minimize unnecessary user actions and make the PageTurner experience more efficient for users.

The PageTurner menu does not have an option for accessing the “Help” screen.

Violation: Help and Documentation

Because it contains the reading function of HathiTrust Mobile, the PageTurner screen is likely to be where users who read documents on the HathiTrust Mobile system spend the most time and encounter the most problems. However, we found during our heuristic evaluation that the system’s “Help” page is not accessible from the PageTurner menu, meaning users seeking help with the system would have to exit the PageTurner screen, go back to the “Record” screen and scroll down to access the “Help” link, which violates the “Help and Documentation” heuristic because the path to the “Help” page is not readily apparent to users and it is not easy for users to map from problem to solution.

RECOMMENDATION 2C: Add a link to the “Help” page from the PageTurner menu.

We recommend that HathiTrust Mobile add a link to the “Help” page to the PageTurner menu to make it easier for users to access solutions to their problems. Although there is not a lot of space for such a link in the PageTurner menu, we would recommend including “Help” under the “Info” tab where the “Feedback” link is currently located.

FINDING 3: HathiTrust Mobile is unable to deliver documents in EPUB format.

Violation: Recognize, Diagnose, and Recover from Errors

HathiTrust Mobile offers logged-in users the options of downloading full-text documents in either PDF or EPUB format. However, during our heuristic evaluation we tried to download documents in EPUB format multiples times, using different devices and trying to download different documents, and failed every time. Each time the system displayed a message indicating that it was creating an EPUB, but after the request timed out it displayed an error message explaining that the EPUB download had failed and that HathiTrust staff had already been notified and suggesting the user try again in 24 hours (see Figure 3 for a screenshot of the error message). Although the error message does present the user with a course of action, it is not a very helpful one; we did try to download EPUB documents again after 24 hours as suggested by the error message and got the same message. This violates the “Recognize, Diagnose, and Recover from Errors” heuristic.

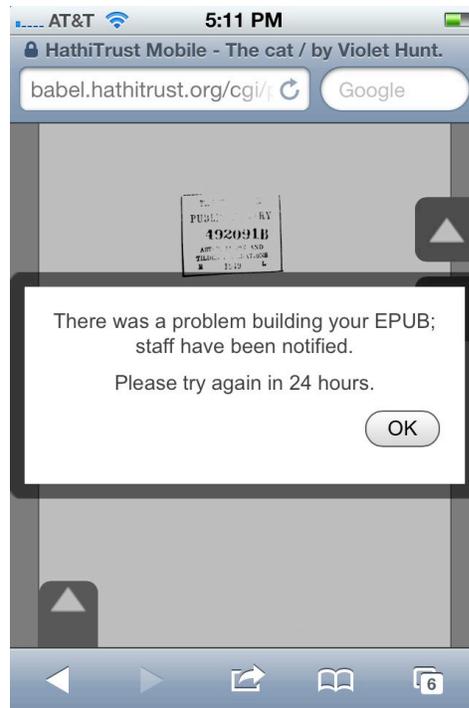


Figure 3 - Error message received when attempting to download an EPUB document.

RECOMMENDATION 3A: Investigate the problem with EPUB documents. If HathiTrust Mobile cannot deliver EPUB documents for some time, remove the option to download EPUB documents from the system.

First and foremost, we recommend that HathiTrust Mobile investigate the system's problem with delivering EPUB documents. This is a problem that should not occur, and at the very least should not occur with the current frequency. However, if the problem cannot be fixed, we recommend that HathiTrust Mobile remove the option to download EPUB documents from the system to prevent further errors and potential user frustration.

RECOMMENDATION 3B: Rewrite error message to be more helpful to users.

As long as downloading EPUB documents is still an option, we also recommend that HathiTrust Mobile rewrite the current error message so that it is better for helping users recover from the error. For example, the error message could provide users with a link to download a PDF version of the document they requested instead of an EPUB.

FINDING 4: Zooming capabilities in PageTurner restrict the reading experience.

We found that the zooming capabilities of the PageTurner part of the HathiTrust Mobile site limited the user's experience in several ways, which we have detailed below.

The zooming capabilities are primitive as compared to the standards exhibited by other reading applications, and are not optimized for mobile devices.

Violation: Consistency and Standards; Aesthetics and Minimalist Design

Prior to this study, we completed a Comparative Analysis that looked at a number of competing mobile reader applications. As a result, we were familiar with the functionalities of similar programs for reading on mobile devices. While evaluating the HathiTrust Mobile site, it became clear that the zooming capabilities of PageTurner were contributing to a negative reading experience. The major weakness we identified as compared to other similar applications' zooming is that the motion is jerky and non-fluid due to limited resolutions available for re-sizing a document. As a result, it is extremely difficult to get a document to fit comfortably within a small mobile screen, particularly since the size of mobile screens varies across devices.

Feedback for the zooming gesture lags, making the application seem non-responsive.

Violation: Visibility of System Status

Another issue that came up during our analysis was the slow response time of the zooming function. When using the "pinch" gesture to increase or decrease the size of the document on the screen, there often would be a notable lag between the motion and the document's resizing. With no status bar or pop-up indicating that the document was rendering, this violates the standard recommending that a wait of over one second warrants a progress indicator for the operation to be displayed for the user. (Johnson, 2010)

RECOMMENDATION 4A: Make zooming more fluid on PageTurner, or consider using a reading application that allows for this capability.

The limitations of the zooming capabilities greatly diminished our reading experience while using the HathiTrust Mobile website. Thus, we recommend that PageTurner be modified to allow for more fluid zooming. One way this might be possible is to compress or decrease the size of the documents being viewed by the application to encourage speedier loading time. This would also cut out the feedback lagging issue that we experienced during heuristic testing. We feel that this is an important enough function to the reading experience that if the zoom levels are not able to be modified, we would suggest that HathiTrust search for another reading application (ideally one that is Open Source, like PageTurner) that allows for better zooming and customization.

RECOMMENDATION 4B: Encourage users to view documents in plain text.

A short-term and more feasible solution could be to increase the prominence of the link to the plain-text versions of documents, which do not experience this zooming issue. The plain-text view is also better optimized for mobile screens.

FINDING 5: The filtering system on HathiTrust Mobile is inefficient.

Violation: Flexibility and Efficiency of Use; Recognition versus Recall

We found that if the user desires to filter his or her displayed results, the current system is very inefficient. The user can only select one filtering criterion at a time, requiring them to go back and forth to select from 8 different criteria.

The user has to go back to the initial filtering page each time they wish to further select criteria for filtering. This is also the case if they want to undo one or several of the filtering

criteria they initially chose. Further, they cannot see what filters they selected from their results page, which adds additional user burden.

Another problem: Reformulating the query (e.g., switching the query from “Mark Twain” to “James Joyce”) gets rid of filters that the user initially had in place, forcing them to start all over again.

RECOMMENDATION 5A: Make the filtering parallel and matrix-style, not linear.

When performing a filtering function, it is natural that the user will have multiple category selections. Therefore, the filters should accommodate this user behavior. Instead of requiring users to go back and forth in their filtering selections, it is best to provide multiple options to optimize their performance. For example, when searching “Mark Twain” as “author,” the user will likely want the language to be English and desire to see his writings simultaneously (currently, we have go through each step to get to these results). Make the filter operate in a “matrix” style.

Another example: if the user wishes to compare “Mark Twain” with “James Joyce,” they should be able to do so without the filters resetting when they switch from one query to the other; make the filter work in parallel here.

RECOMMENDATION 5B: Make selected filters viewable from the search results screen.

Additionally, place the filter selections on the results screen. Users may not necessarily remember all the filtering settings they previously chose. The current set-up requires them to go back to the initial filtering page to view what they have selected. It is therefore important to have any earlier filtering history/results displayed at the top of the results screen.

FINDING 6: HathiTrust Mobile is incompatible with the HTC T-Mobile G2 device.

Violation: Visibility of System Status; Consistency and Standards

One of the evaluators used an HTC T-Mobile G2 smartphone to perform the heuristic evaluation (See Appendix C for device specs of all evaluators). The website functioned normally for searching and selecting records, but once a record was opened in PageTurner the site would freeze. Inconsistently, the application did not freeze, but the pages displayed did not contain any content and were simply white. Concerned that this was an issue with the default Android system web browser, a third-party web browser, Firefox, was installed, and the results were the same. For comparison, a brief test was performed on a different device, using a different mobile network but using the same Android operating system. This yielded different results, and we were able to use the HathiTrust mobile site and PageTurner with complete functionality.

RECOMMENDATION 6: Conduct broader testing of devices, systems and networks.

It is unclear why this particular device had such difficulty, but there are a few reasons that may be illuminated with more testing. We recommend first starting with statistics around mobile device ownership. The browser analytics for the mobile site show that an overwhelming amount of users are running Safari, which suggests that they are using an iPod, iPhone or iPad

to access the site. This is congruent with the operating system analytics, which show that the site is most often accessed on an iPad. In both analytics sections, the next largest group is Android users. If resources allow, testing should be done with the top 3 to 5 devices to ensure optimal functionality for most users.

An initial look at the service provider analytics indicates that 3 of the top 10 service providers were mobile, which suggests that most users are accessing the site via a WiFi connection. While the Android phone tested was on a 4G network with full reception, mobile connection speed may have been a cause for the malfunctions; more research needs to go into most commonly used service providers and connection speeds in order to optimize site performance. A script might be written that detects device information and connection speed, and in the event of a slower connection defaults to the plain text view instead of the PDF image view.

Another possible reason for the mobile site not working on the HTC T-Mobile G2 smartphone could be validation errors on the site. The World Wide Web Consortium (W3C) is an international community whose mission it is to decide upon guidelines and best practices to ensure that the full potential of the web is met. As a service to web developers they offer a free HTML and CSS validation service that parses your pages and finds errors in your code. It then returns those errors or if your site did not contain errors, then you can place a placard on your site stating that you have valid markup. A run through the <http://w3.org> validation service showed 45 errors (See Appendix E) for the <http://m.hathitrust.org> site. In general, these errors do not cause major problems, and browsers are designed to deal with these errors to some extent in order to optimize user experience, but it is a possibility that one or more of these validation errors cause the malfunction. As part of broader testing, we recommend that HathiTrust Mobile investigate the errors returned by the W3C validation service to determine whether this has any impact on the HTC T-Mobile G2 performance issue.

Discussion

While we obtained valuable information from our heuristic evaluation of HathiTrust Mobile, we recognize that there are notable limitations to our findings and recommendations. First and foremost, we understand that some of recommendations may not be feasible for HathiTrust Mobile based on availability of staff and financial resources. For example, with regards to PageTurner, while it is an open source application, its customizability might be limited and, thus, it might be unable to accommodate many of our recommendations. This is not so much a result of aiming high as it is the types of issues we encountered. Also, finding the time, money and/or staff to write, test and install new features may limit the feasibility of some of our recommendations.

Additionally, there are limitations to our ability to evaluate HathiTrust Mobile. Due to our familiarity with the site it is possible that we have missed some issues. Bugs or issues that we were already aware of and accustomed to working around may have been glossed over

inadvertently. This will be confirmed or denied in the coming weeks during the usability tests as we hope to run tests with users who are not as familiar with the site as we are.

Another limitation to our evaluation was a lack of diverse devices with which to test HathiTrust Mobile. 3 of the 4 evaluators used iOS devices, which may have biased the results. A more thorough evaluation would have been achieved with 4 different devices running different operating systems. The argument can be made, however, that by having a common denominator like an operating system, more granular differences in experience can be discovered without having to deal with broader system-specific differences.

Conclusion

Despite our familiarity with the HathiTrust Mobile possibly biasing our evaluations, we feel strongly that we have identified important areas for improvement within the website, more specifically with the user's freedom to manipulate the collection through customization and filtering; PageTurner's menu and zooming function; access to EPUB documents, and universal compatibility with mobile devices. We recognize that some of our recommendations may not be feasible in the short-term due to constraints such as budget and manpower, but we still feel that they are important for consideration down the line as resources free up.

It seems the next logical step for improving the HathiTrust Mobile user experience involves working to make sure the website is compatible with all major mobile devices, as incompatibility potentially eliminates a large block of potential users from even accessing the collections on their mobile devices. As bugs are tweaked and improvements are made, further heuristic testing should be carried out to ensure that users are getting the best experience possible.

References

- Johnson, J. (2010). *Designing with the Mind in Mind: A Simple Guide to Understanding User Interface Design Rules*. San Francisco, CA: Morgan Kaufmann.
- Nielsen, J., & Mack, R. L. (1994). *Usability Inspection Methods*. New York: Wiley.

Appendices

A baseline for evaluation needs to be established before moving forward with any evaluation. For our purposes we relied on those heuristics defined by Jakob Nielsen (See Appendix A). These heuristics include categories such as “Visibility of System Status,” “User Control and Freedom,” and “Consistency and Standards.” The other appendices that follow include our aggregated individual heuristic evaluations, a complete validation report from w3.org, and other information such as the testing environment of each evaluator.

Appendix A – Heuristics and Descriptions

Heuristic	Evaluation Questions
Visibility of System Status	Can the user tell where he/she is in the system? Does the system provide feedback for user actions and system status information? Can the user tell what options are available for what to do next?
Match Between System and Real World	Does the system use language that is likely to be familiar to a lay user? If metaphors are used, do they help or hinder interaction? (e.g. page turning)
User Control and Freedom	Can the user undo/redo or revert mistaken input or paths? Can the user pause long-running tasks (e.g. reading a lengthy document or conducting a complex search) with impunity?
Consistency and Standards	Does the system validate with http://validator.w3.org/ ? Is the system consistent with other reading applications? Google Books? Is the system internally consistent? Do similar things work similarly? Is the system consistent with the main HathiTrust site?
Recognition Rather Than Recall	Does the system expect users to remember earlier actions/decisions when completing later steps?
Flexibility and Efficiency of Use	Can expert users develop custom ways to navigate more quickly? (e.g. shortcuts, saved searches) Does the system allow people with different styles/preferences to accomplish tasks?
Aesthetics and Minimalist Design	Minimalist design? Optimized for small screens? Is there any extraneous information on the screen? Unnecessary graphic elements?
Help Users Recognize, Diagnose, Recover from Errors	When errors occur, are users made aware of them? Does the error message provide users with a clear course of actions? Are users able to send error messages to be diagnosed directly from the screen on which they occur?
Help and Documentation	Is there help or documentation? Can users find it easily?

Appendix B – Severity Scale and Descriptions

Rating	Significance
0	Observation about the usability of the site that does not represent an issue to be fixed
1	Usability issue that affected our evaluation, but that is unlikely to affect the experience of a typical user
2	Minor usability issue that could be fixed to improve the look and feel of the site
3	Moderate usability issue that stakeholders should be aware of
4	Major usability issue that should be fixed as soon as possible
5	Major usability issue that prevents a feature or site section from being used and should be fixed immediately

Appendix C – Evaluator Environment Specs

Evaluator	JP	Melody	Kyle	Kate
Code	JO	MK	KSD	KPD
Device	HTC T-Mobile G2	Apple iPod Touch	Apple iPad 2	Apple iPhone 4S
Operating System	Android 2.3.4	iOS 5.0.1	iOS 5.0.1	iOS 5.0.1
Browser	Android	Safari	Safari	Safari

Appendix D – Aggregated Heuristic Evaluations

Visibility of System Status

Can the user tell where he/she is in the system?
 Does the system provide feedback for user actions and system status information?
 Can the user tell what options are available for what to do next?

Issue #	Description of Issue	Severity/Priority Rating	USER
	Record page shows that user is on result x of xx	n/a	ksd
	From record page, the options for what a user can do next are spread all over. For example, there is a direct link to "email this record" and "view this record in regular catalog", but "find in a library" is hidden within the link to access more detailed information about the record. The link for "Full View" is not the same size or style as the other links.	3	ksd
	Feedback lags for the zooming function on Page Turner.	3	ksd
	When PDF is being generated, a status bar pops up to inform user of progress	n/a	ksd
	When document is loading, screen pops up to say that document is loading, and then says when loading is finished	n/a	ksd
	Contents section allows user to jump to different sections of document	n/a	ksd
	Dragging on the status bar shows the page number the user would be taken to.	n/a	ksd
	User is given green successful status message after emailing a record	n/a	ksd
1	Timing of feedback for opening a book in PageTurner is off; sometimes I got a message that the book was "all finished" but the pages had not loaded yet, and sometimes the pages loaded before the "all finished" message"	2	kpd
2	From "Record" pages, users don't know that they can download a PDF of the book or find it in a library	3	kpd
3	"Search Inside" function of PageTurner screen doesn't have a prompt to "Search Inside" in the text page like the Home/Search screen does (i.e., "Search Catalog")—not sure if this is more a consistency problem; also button says "Find" rather than "Search"	2	kpd
N/A	Good feedback/status bar for building PDF, etc.	N/A	kpd
	where the user is in the system is implicit because the nature of the site is linear, meaning that users can only go forward and backward, not jump around. The only alternative is to click on the logo in the upper-lefthand corner and return to the home page. The top of each page shows the title of the previous page which might be confusing for the user. There isn't a title of your current spot in the website.	2/5	jo
	There is a progress bar at the bottom of the reader, but it does not give any feedback or information about where I am in the document.	2/5	jo

	A pop up reading "All Finished" states when the document has fully loaded.	n/a	jo
	When I push the link, it becomes highlighted, which confirms my choice.	n/a	jo
	My options are clear on each page as to what I am able to do next.,	n/a	jo
	Unclear about the display order of the results - by alphabetic, filtering criteria, etc?	5	mk
	Insufficient Filtering criteria setting (viewability, author, language, publication, format..) - need advanced filtering	3	mk
	Unclear about the filtering criteria (i.e. why "author" as a filtering criteria show up again after the first search criteria "author" ?)	4	mk
	Takes extra steps to find indication of where I am at when reading from the progress bar	3	mk
	Can only select one search criteria at a time - not efficient	5	mk
	Can only select one filter criteria at a time - not efficient	5	mk
	No further search function which makes the search inefficient particularly when a large collection is presented	3	mk

Match Between System and Real World

If metaphors are used, do they help or hinder interaction? (e.g. page turning)

Issue #	Description of Issue	Severity/Priority Rating	USER
	Page Turning metaphor doesn't match up with swiping motion to actually advance page	3	ksd
1	Page turning gesture (scroll down) does not imitate real life and would not be familiar to a user of books or other reading apps	4	kpd
2	Term "Full View" (Record page) is inconsistent with reading books; could say "Go to Book" or "Read Book" or "View Book" rather than "Go to Full View"; on Search page "Full View" could be	1	kpd
	The language is familiar and resembles a traditional library.	n/a	jo
	Different meanings for the same words "author" and "subject" used in search box and filtering criteria	4	mk
	"full view only" under the search boxes and "viewability" under filtering - are they the same? However, the "full view only" shows unchecked even after you check the filter results	2	mk

User Control and Freedom

Can the user undo or revert mistaken input or paths?
 Can the user pause long-running tasks (e.g. reading a lengthy document or conducting a complex search) with impunity?

Issue #	Description of Issue	Severity/Priority Rating	USER
	If user opts to log in from record screen, she is returned to the same record after completion	n/a	ksd

	If clicking "Info" in Page Turner, the "Back to Record" button takes the user back to the record listing, and not to the reading. There is a differently marked "Close" link that isn't immediately obvious. The user can undo this mistake by hitting the back button in her browser and go back to where she was in the record.	1	ksd
	If the user goes to log in from the "Get Book" pop-up screen in Page Turner, when she is returned to the record, her place is not kept and she is back at the first page.	2	ksd
	After downloading record as PDF, I wanted to go back to the Page Turner site, and hitting back on the browser pulls up a Please Wait dialog box, stating that it is loading book data, but it doesn't appear to be loading.	4	ksd
	If user accidentally hits "Back to Record" rather than Close on a pop-up in Page Turner, and tries to get back into Page Turner from the record, her place in the document is lost.	2	ksd
1	System does not save users' place in a book or their search results when logged in	3	kpd
2	(cont'd) There is no way to save materials to your HathiTrust account via mobile, no collections feature	4	kpd
3	Users cannot access the Results page directly from PageTurner; unless they start a new search altogether, this is the page they are most likely to want to access from PageTurner	2	kpd
4	When users download a PDF, system does not open a new browser tab where the document appears; difficult to navigate between PDF screen and HT mobile system; also, where is the PDF saved???	4	kpd
5	Users cannot easily delete long queries from search box when they are incorrect; the search has not returned any results (many apps/input fields have an "x" button that deletes whole query rather than having users manually delete queries; this is especially useful on mobile)	2	kpd
	There is little room for mistake, if the incorrect record is selected from the results list, the user is able to return to the list by using the link at the top or the back button on their browser.	n/a	jo
	"Content" section allows for broad, imprecise jumping to different sections.		jo
	Yes, you can open a new browser window or exit the browser to use another application	n/a	jo
	Cannot return to the previous page or function once exit the system, the system does not save latest usage	5	mk
	When use find function while reading, the system does not allow to return back to the previous reading page		mk
	Would be nice to have a default search setting, (i.e. language and location, email -from)	4	mk
	The system only allows to trace back one step at a time	5	mk
Consistency and Standards			

Is the system consistent with other reading applications? Google Books? Is the system internally consistent? Do similar things work similarly? Is the system consistent with the main HT site?			
Issue #	Description of Issue	Severity/Priority Rating	USER
	Links for further actions from record page are not consistent. (e.g. email record v. full view)	3	ksd
	In Page Turner, when iPad is in landscape mode, a horizontal page-swipe turns the pages, but when in letter mode, the swiping motion is vertical.	4	ksd
	In Page Turner, clicking the "Info" button brings up a dialog box. The buttons there to go Back to Record and Feedback are different than to Close the dialog box	1	ksd
	In Page Turner, zooming isn't consistent with the zooming on similar applications. The motion isn't fluid, and the zoom levels seem to be pre-defined, resulting in a jerky motion.	4	ksd
1	Unlike other reading apps, users on some devices cannot use the swipe gesture for page turning; this is inconsistent across devices (see Issue 1 under consistency with real world)	4	kpd
2	"Full View" is not consistently applied to records with multiple volumes (e.g., Go to V.1); (or to other records apparently—one record said "Go to 1887" rather than "Go to Full View"; 1887 was not the title or vol number but the year of publication and it was also the only option)	2	kpd
3	Navigation arrows are not aesthetically consistent "<<" for backward navigation, but forward arrows are single, thicker ">"	1	kpd
4	Availability of collections or a "My Library" feature is inconsistent between HT mobile and HT regular as well as HT mobile and other mobile reading applications	4	kpd
	Site does not validate. This doesn't affect usability as a whole but could pose issues depending on the browser that is being used.	3/5	jo
	Color and branding are consistent with the main HT site, but functionality is different.	1/5	jo

	Links, features design are consistent throughout the site.	n/a	jo
	The reading /viewing tool bar is different in both location, display and some functions between regular and the mobile sites.	2	mk
	when send the record to share via email, the link is on the mobile site - would be better to have both regular and mobile links.	4	mk
	In addition to the advance search, mobile site also does not have the critical sorting function within the results	5	mk

Recognition Rather Than Recall

Does the system expect users to remember earlier actions/decisions when completing later steps?

Issue #	Description of Issue	Severity/Priority Rating	USER
	If user searches with terms that don't exist, a message loads telling them to revise search phrase, but also keeps old search in box so that the user can see what she previously searched. (scnsht)	n/a	ksd
	After having to close the browser window, when the user reopens the HT mobile site, she is still logged in.	n/a	ksd
	Old searches do not appear to autocomplete.	1	ksd
	If user reformulates query after filtering search results, the filter settings are lost.	2	ksd
	Searched term stays in search box on results page, which helps user see what she previously searched to come up with these results.	n/a	ksd
1	Users must remember how they have filtered their results, they can check the filter screen, but the results page does not indicate how the results it displays have been filtered (it does, however, note if they have been filtered by "full text search only" from the Home/Search screen	3	kpd
	when go to the page that find function indicates, the text does not highlight the text and does not return to the find function	3	mk
	Instead of the display the specific (i.e. a book name) like the regular site does, search Google search box show at the top of reading page with no info about the search	2	mk

Flexibility and Efficiency of Use

Can expert users develop custom ways to navigate more quickly? (e.g. shortcuts, saved searches) Does the system allow people with different styles/preferences to accomplish tasks?			
Issue #	Description of Issue	Severity/Priority Rating	USER
			ksd
	In Page Turner, user has to click the arrow at bottom right of screen to pull up menu, rather than being able to just tap anywhere on the screen to bring up menu.	2	ksd
	To retract the Page Turner menu, the user must tap on the same bottom right-side arrow. The menu does not just retract independently after a period of time.	2	ksd
	When filtering results, selecting 1 filter takes the user back to results page where she has to select "Filter" again; she cannot select more than 1 filtering option at a time.	2	ksd
	If reformulating a query gets you no results, there is no option to "return to previous search results"; you would have to rely on the back button	1	ksd
	There is no way to get back to the results list from Page Turner without first going back to the record page.	2	ksd
1	Users cannot save searches, records, or full text documents within HT mobile; search box also doesn't remember recent searches or prior searches (this happens on Google etc., can they make it happen on HT mobile?)	4	kpd
2	System does not allow users to find documents/texts by browsing, only by search	4	kpd
	You can create collections, but not save searches or change the interface	2/5	jo
	It does accommodate users with different goals. You can search and save (with login) or read or email, depending on what you want to do.		jo
	the two arrows for viewing the page are too close together -	2	mk
Aesthetics and Minimalist Design			
Minimalist design? Optimized for small screens? Is there any extraneous information on the screen? Unnecessary graphic elements?			
Issue #	Description of Issue	Severity/Priority Rating	USER
	Main page is optimized for mobile screens, and is easy to navigate and minimalistic.	n/a	ksd
1	Pageturner view uses icons but also text describing what the icon is; although most apps use icons alone and most of the HT mobile icons are very conventional, making the text unnecessary; this is also true under "Settings" within PageTurner	3	kpd
2	To open PageTurner menu, users have to click a small box with an arrow, and to close it they have to click that arrow again. There is a very small range where users can touch to open the menu—the range should be much bigger, if not the whole screen. As it is, this is not optimized for smaller mobile devices.	4	kpd
3	PageTurner screen does not automatically disappear when it times out—inconsistent with other readings apps	4	kpd
4	Zoom is not optimized for mobile devices; there seems to be a pre-set zoom, which is not optimized for phone screen size (one options is too big and the next too small, etc.); users should be able to control their own zoom	4	kpd

5	On Record page, "Full View" icon and text unnecessary since the text already says "Go to Full View" with an arrow for navigation	1	kpd
	very minimal design		jo
	rotating the screen in order to zoom in causes some issues: reader stops working correctly and only half of the document becomes visible. I had to reload the page and lost my spot	5/5	jo
	"full view only" under the search boxes and "viewability" under filtering - are they the same?	3	mk
	prefer displaying progress bar	2	mk
	Google search box show at the top of reading page - which takes space and could be dist	3	mk
Help Users Recognize, Diagnose, Recover from Errors			
When errors occur, are users made aware of them?			
Does the error message provide users with a clear course of actions?			
Are users able to send error messages to be diagnosed directly from the screen on which they occur?			
Issue #	Description of Issue	Severity/Priority Rating	USER
	When going to "Get this Book" from Page Turner, the user is informed of which options will require a partner login	n/a	ksd
	When emailing a record, the user must enter valid email address formats for both sender and recipient, and is presented with an error message (but doesn't lose previously entered data)	n/a	ksd
	When user goes to "Get This Book" from Page Turner and selects an option that requires login, clicking OK on the dialog box doesn't take you to the login screen, but back to the record, and there is no direct way to log in from Page Turner.	2	ksd
1	Lack of error messages on the site (am I wrong?); when there has been a message saying "Loading book data" but the book data has not loaded for more than a couple minutes, there should be an error message that appears on the screen and invites users to give feedback; it should also invite users to go back to the Home/Search screen or their Results screen	4	kpd
2	Users are unable to send error messages to be diagnosed directly from the screen on which they occur	3	kpd
3	Feedback form is not prominent on site and is not optimized for mobile (perhaps there could be common problems that users could pick from a list instead of an open-text input box?)	3	kpd
N/A	I did get an error message after trying to dload an EPUB file with HT mobile on my computer, but it wasn't particularly helpful—said staff had already been notified and that I should try again in 24 hours (screenshot in SI622 dropbox folder)	N/A	kpd
N/A	Message explaining that the system found no search results for unintelligible input (asdfasd) is adequate	N/A	kpd
	There didn't appear to be any errors, but bugs in the system did occur without any feedback. I had to go back a page and then go back into the book, which started me over at the beginning.	4/5	jo

	there is a feedback option to report any issues.		jo
	Difficult to know if you have made a mistake	4	mk
Help and Documentation			
Is there help or documentation? Can users find it easily?			
Issue #	Description of Issue	Severity/Priority Rating	
	Help is located on main page in bottom navigation links.		ksd
1	Users can't access "Help" from PageTurner screen	3	kpd
	There is a help link at the bottom of the page, though it isn't available in the reader. Users will have to back out of the reader, effectively losing their place.	3/5	jo
	Under the comments, it would be nice to have email set by default	2	mk
	After typing the feedback, instead of returning to the previous page, it goes to the home page	3	mk
	Instead of providing direct assistance as expected, most of the info in the help page describes the difference between regular and mobile sites	4	mk

Appendix E – Validation Results from W3C



Jump To: [Validation Output](#)

Errors found while checking this document as XHTML Mobile Profile 1.0!

Result:	45 Errors, 3 warning(s)	
Address :	<input type="text" value="http://m.hathitrust.org/"/>	
Modified:	Thu, 06 Oct 2011 16:27:30 GMT	
Server:	Apache/1.3.41 (Unix)	
Size:	5690	
Content-Type:	text/html	
Encoding :	utf-8	<input type="text" value="(detect automatically)"/>
Doctype :	XHTML Mobile Profile 1.0	<input type="text" value="(detect automatically)"/>
Root Element:	HTML	

Options

- Show Source Show Outline List Messages Sequentially Group Error Messages by Type
 Validate error pages Verbose Output Clean up Markup with HTML-Tidy

[Help](#) on the options is available.

[Revalidate](#)

↑ TOP

Validation Output: 45 Errors

✘ Line 1, Column 111: DTD did not contain element declaration for document type name

```
...UM//DTD XHTML Mobile 1.0//EN" "http://www.wapforum.org/DTD/xhtml-mobile10.dtd" >
```

A DOCTYPE declares the version of the language used, as well as what the root (top) element of your document will be. For example, if the top element of your document is <html>, the DOCTYPE declaration will look like: "<!DOCTYPE html".

In most cases, it is safer not to type or edit the DOCTYPE declaration at all, and preferable to let a tool include it, or copy and paste it from a [trusted list of DTDs](#).

✘ Line 7, Column 49: there is no attribute "lang"

```
<html xmlns="http://www.w3.org/1999/xhtml" lang="en"><head>
```

You have used the attribute named above in your document, but the document type you are using does not support that attribute for this element. This error is often caused by incorrect use of the "Strict" document type with a document that uses frames (e.g. you must use the "Transitional" document type to get the "target" attribute), or by using vendor proprietary extensions such as "marginheight" (this is usually fixed by using CSS to achieve the desired effect instead).

This error may also result if the element itself is not supported in the document type you are using, as an undefined element will have no supported attributes; in this case, see the element-undefined error message for further information.

How to fix: check the spelling and case of the element and attribute, (Remember XHTML is all lower-case) and/or check that they are both allowed in the chosen document type, and/or use CSS instead of this attribute. If you received this error when using the <embed> element to incorporate flash media in a Web page, see the [FAQ item on valid flash](#).

 **Line 7, Column 53: document type does not allow element "html" here** 

```
<html xmlns="http://www.w3.org/1999/xhtml" lang="en" ><head>
```

The element named above was found in a context where it is not allowed. This could mean that you have incorrectly nested elements -- such as a "style" element in the "body" section instead of inside "head" -- or two elements that overlap (which is not allowed).

One common cause for this error is the use of XHTML syntax in HTML documents. Due to HTML's rules of implicitly closed elements, this error can create cascading effects. For instance, using XHTML's "self-closing" tags for "meta" and "link" in the "head" section of a HTML document may cause the parser to infer the end of the "head" section and the beginning of the "body" section (where "link" and "meta" are not allowed; hence the reported error).

 **Line 8, Column 70: end tag for "meta" omitted, but OMITTAG NO was specified** 

```
<meta http-equiv="Content-Type" content="text/html; charset=UTF-8":
```

You may have neglected to close an element, or perhaps you meant to "self-close" an element, that is, ending it with "/>" instead of ">".

 **Line 8, Column 3: start tag was here**

```
<meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
```

 **Line 9, Column 48: end tag for "meta" omitted, but OMITTAG NO was specified** 

```
<meta name="HandheldFriendly" content="true >
```

You may have neglected to close an element, or perhaps you meant to "self-close" an element, that is, ending it with "/>" instead of ">".

 **Line 9, Column 3: start tag was here**

```
<meta name="HandheldFriendly" content="true">
```

 **Line 10, Column 50: end tag for "link" omitted, but OMITTAG NO was specified** 

```
<link rel="alternate" media="handheld" href=" >
```

You may have neglected to close an element, or perhaps you meant to "self-close" an element, that is, ending it with "/>" instead of ">".

 **Line 10, Column 3: start tag was here**

```
<link rel="alternate" media="handheld" href="">
```

✖ Line 11, Column 65: end tag for "link" omitted, but OMITTAG NO was specified

```
<link rel="icon" type="image/png" href="apple-touch-icon.png" >
```

You may have neglected to close an element, or perhaps you meant to "self-close" an element, that is, ending it with "/>" instead of ">".

ℹ Line 11, Column 3: start tag was here

```
<link rel="icon" type="image/png" href="apple-touch-icon.png">
```

✖ Line 12, Column 106: end tag for "meta" omitted, but OMITTAG NO was specified

```
...ntent="width=device-width,initial-scale=1.0,maximum-scale=1.0,user-scalable=0" >
```

You may have neglected to close an element, or perhaps you meant to "self-close" an element, that is, ending it with "/>" instead of ">".

ℹ Line 12, Column 3: start tag was here

```
<meta name="viewport" content="width=device-width,initial-scale=1.0,maximum-s...
```

✖ Line 13, Column 125: end tag for "meta" omitted, but OMITTAG NO was specified

```
...-width; initial-scale=1.0; maximum-scale=1; minimum-scale=1; user-scalable=0;" >
```

You may have neglected to close an element, or perhaps you meant to "self-close" an element, that is, ending it with "/>" instead of ">".

ℹ Line 13, Column 3: start tag was here

```
<meta name="viewport" content="width=device-width; initial-scale=1.0; maximum...
```

✖ Line 14, Column 56: end tag for "meta" omitted, but OMITTAG NO was specified

```
<meta name="format-detection" content="telephone=no" >
```

You may have neglected to close an element, or perhaps you meant to "self-close" an element, that is, ending it with "/>" instead of ">".

ℹ Line 14, Column 3: start tag was here

```
<meta name="format-detection" content="telephone=no">
```

✖ Line 16, Column 15: there is no attribute "src"

```
<script src="index_files/jquery.js" charset="utf-8"></script>
```

You have used the attribute named above in your document, but the document type you are using does not support that attribute for this element. This error is often caused by incorrect use of the "Strict" document type with a document that uses frames (e.g. you must use the "Transitional" document type to get the "target" attribute), or by using vendor proprietary extensions such

as "marginheight" (this is usually fixed by using CSS to achieve the desired effect instead).

This error may also result if the element itself is not supported in the document type you are using, as an undefined element will have no supported attributes; in this case, see the element-undefined error message for further information.

How to fix: check the spelling and case of the element and attribute, (Remember XHTML is all lower-case) and/or check that they are both allowed in the chosen document type, and/or use CSS instead of this attribute. If you received this error when using the <embed> element to incorporate flash media in a Web page, see the [FAQ item on valid flash](#).

Line 16, Column 47: there is no attribute "charset"

```
<script src="index_files/jquery.js" charset:"utf-8"></script>
```

You have used the attribute named above in your document, but the document type you are using does not support that attribute for this element. This error is often caused by incorrect use of the "Strict" document type with a document that uses frames (e.g. you must use the "Transitional" document type to get the "target" attribute), or by using vendor proprietary extensions such as "marginheight" (this is usually fixed by using CSS to achieve the desired effect instead).

This error may also result if the element itself is not supported in the document type you are using, as an undefined element will have no supported attributes; in this case, see the element-undefined error message for further information.

How to fix: check the spelling and case of the element and attribute, (Remember XHTML is all lower-case) and/or check that they are both allowed in the chosen document type, and/or use CSS instead of this attribute. If you received this error when using the <embed> element to incorporate flash media in a Web page, see the [FAQ item on valid flash](#).

Line 16, Column 54: element "script" undefined

```
<script src="index_files/jquery.js" charset="utf-8"></script>
```

You have used the element named above in your document, but the document type you are using does not define an element of that name. This error is often caused by:

- incorrect use of the "Strict" document type with a document that uses frames (e.g. you must use the "Frameset" document type to get the "<frameset>" element),
- by using vendor proprietary extensions such as "<spacer>" or "<marquee>" (this is usually fixed by using CSS to achieve the desired effect instead).
- by using upper-case tags in XHTML (in XHTML attributes and elements must be all lower-case).

Line 17, Column 16: there is no attribute "type"

```
<script type:"text/javascript" charset="utf-8">
```

You have used the attribute named above in your document, but the document type you are using does not support that attribute for this element. This error is often caused by incorrect use of the "Strict" document type with a document that uses frames (e.g. you must use the "Transitional" document type to get the "target" attribute), or by using vendor proprietary extensions such as "marginheight" (this is usually fixed by using CSS to achieve the desired effect instead).

This error may also result if the element itself is not supported in the document type you are using, as an undefined element will have no supported attributes; in this case, see the element-undefined error message for further information.

How to fix: check the spelling and case of the element and attribute, (Remember XHTML is all lower-case) and/or check that they are both allowed in the chosen document type, and/or use CSS instead of this attribute. If you received this error when using the <embed> element to incorporate flash media in a Web page, see the [FAQ item on valid flash](#).

Line 17, Column 49: element "script" undefined

```
<script type="text/javascript" charset="utf-8">
```

You have used the element named above in your document, but the document type you are using does not define an element of that name. This error is often caused by:

- incorrect use of the "Strict" document type with a document that uses frames (e.g. you must use the "Frameset" document type to get the "<frameset>" element),
- by using vendor proprietary extensions such as "<spacer>" or "<marquee>" (this is usually fixed by using CSS to achieve the

desired effect instead).

- by using upper-case tags in XHTML (in XHTML attributes and elements must be all lower-case).

Line 36, Column 104: element "script" undefined

```
... src="http://babel.hathitrust.org/cgi/ping?callback=HT.update_status" ></script>
```

You have used the element named above in your document, but the document type you are using does not define an element of that name. This error is often caused by:

- incorrect use of the "Strict" document type with a document that uses frames (e.g. you must use the "Frameset" document type to get the "<frameset>" element),
- by using vendor proprietary extensions such as "<spacer>" or "<marquee>" (this is usually fixed by using CSS to achieve the desired effect instead).
- by using upper-case tags in XHTML (in XHTML attributes and elements must be all lower-case).

Line 38, Column 49: element "script" undefined

```
<script type="text/javascript" charset="utf-8" >
```

You have used the element named above in your document, but the document type you are using does not define an element of that name. This error is often caused by:

- incorrect use of the "Strict" document type with a document that uses frames (e.g. you must use the "Frameset" document type to get the "<frameset>" element),
- by using vendor proprietary extensions such as "<spacer>" or "<marquee>" (this is usually fixed by using CSS to achieve the desired effect instead).
- by using upper-case tags in XHTML (in XHTML attributes and elements must be all lower-case).

Line 41, Column 85: element "script" undefined

```
...index_files/htm-concat-min.js" type="text/javascript" charset="utf-8" ></script>
```

You have used the element named above in your document, but the document type you are using does not define an element of that name. This error is often caused by:

- incorrect use of the "Strict" document type with a document that uses frames (e.g. you must use the "Frameset" document type to get the "<frameset>" element),
- by using vendor proprietary extensions such as "<spacer>" or "<marquee>" (this is usually fixed by using CSS to achieve the desired effect instead).
- by using upper-case tags in XHTML (in XHTML attributes and elements must be all lower-case).

Line 42, Column 20: there is no attribute "language"

```
<script language:"JavaScript" type="text/javascript" charset="utf-8">
```

You have used the attribute named above in your document, but the document type you are using does not support that attribute for this element. This error is often caused by incorrect use of the "Strict" document type with a document that uses frames (e.g. you must use the "Transitional" document type to get the "target" attribute), or by using vendor proprietary extensions such as "marginheight" (this is usually fixed by using CSS to achieve the desired effect instead).

This error may also result if the element itself is not supported in the document type you are using, as an undefined element will have no supported attributes; in this case, see the element-undefined error message for further information.

How to fix: check the spelling and case of the element and attribute, (Remember XHTML is all lower-case) and/or check that they are both allowed in the chosen document type, and/or use CSS instead of this attribute. If you received this error when using the <embed> element to incorporate flash media in a Web page, see the [FAQ item on valid flash](#).

✖ Line 42, Column 71: element "script" undefined

```
<script language="JavaScript" type="text/javascript" charset="utf-8" >
```

You have used the element named above in your document, but the document type you are using does not define an element of that name. This error is often caused by:

- incorrect use of the "Strict" document type with a document that uses frames (e.g. you must use the "Frameset" document type to get the "<frameset>" element),
- by using vendor proprietary extensions such as "<spacer>" or "<marquee>" (this is usually fixed by using CSS to achieve the desired effect instead).
- by using upper-case tags in XHTML (in XHTML attributes and elements must be all lower-case).

✖ Line 46, Column 63: an attribute value must be a literal unless it contains only name characters

```
... jq(f).append('<input type="hidden" name="filter[]" value:\'format:Serial\''>');
```

You have used a character that is not considered a "name character" in an attribute value. Which characters are considered "name characters" varies between the different document types, but a good rule of thumb is that unless the value contains *only* lower or upper case letters in the range a-z you must put quotation marks around the value. In fact, unless you have *extreme* file size requirements it is a very very good idea to *always* put quote marks around your attribute values. It is never wrong to do so, and very often it is absolutely necessary.

✖ Line 46, Column 81: end tag for "input" omitted, but OMITTAG NO was specified

```
... jq(f).append('<input type="hidden" name="filter[]" value=\'format:Serial\''>');
```

You may have neglected to close an element, or perhaps you meant to "self-close" an element, that is, ending it with ">" instead of ">".

📍 Line 46, Column 20: start tag was here

```
jq(f).append(<input type="hidden" name="filter[]" value=\'format:Ser
```

✖ Line 51, Column 96: end tag for "link" omitted, but OMITTAG NO was specified

```
...lesheet" type="text/css" charset="utf-8" href="index_files/htm-concat-min.css" >
```

You may have neglected to close an element, or perhaps you meant to "self-close" an element, that is, ending it with ">" instead of ">".

📍 Line 51, Column 3: start tag was here

```
<link rel="stylesheet" type="text/css" charset="utf-8" href="index_files/htm-...
```

✖ Line 54, Column 15: there is no attribute "onload"

```
<body onload:scrollTo(0,1);>
```

You have used the attribute named above in your document, but the document type you are using does not support that attribute for this element. This error is often caused by incorrect use of the "Strict" document type with a document that uses frames (e.g. you must use the "Transitional" document type to get the "target" attribute), or by using vendor proprietary extensions such as "marginheight" (this is usually fixed by using CSS to achieve the desired effect instead).

This error may also result if the element itself is not supported in the document type you are using, as an undefined element will

have no supported attributes; in this case, see the element-undefined error message for further information.

How to fix: check the spelling and case of the element and attribute, (Remember XHTML is all lower-case) and/or check that they are both allowed in the chosen document type, and/or use CSS instead of this attribute. If you received this error when using the <embed> element to incorporate flash media in a Web page, see the [FAQ item on valid flash](#).

✘ Line 55, Column 76: document type does not allow element "img" here; missing one of "h1", "h2", "h3", "h4", "h5", "h6", "p", "div", "address", "fieldset" start-tag

```
" or "<table>") inside an inline element (such as "<a>", "<span>", or "<font>").

**✘ Line 55, Column 77: end tag for "img" omitted, but OMITTAG NO was specified**

```
" instead of ">".

📍 Line 55, Column 3: start tag was here

```

```

✘ Line 56, Column 71: document type does not allow element "img" here; missing one of "h1", "h2", "h3", "h4", "h5", "h6", "p", "div", "address", "fieldset" start-tag

```
" or "<table>") inside an inline element (such as "<a>", "<span>", or "<font>").

**✘ Line 56, Column 72: end tag for "img" omitted, but OMITTAG NO was specified**

```
" instead of ">".

📍 Line 56, Column 3: start tag was here

```

```

✘ Line 57, Column 118: there is no attribute "onsubmit"

```
...atalog.hathitrust.org/Search/Home" name="searchForm" onsubmit=".....fixform(this)">
```

You have used the attribute named above in your document, but the document type you are using does not support that attribute for this element. This error is often caused by incorrect use of the "Strict" document type with a document that uses frames (e.g. you must use the "Transitional" document type to get the "target" attribute), or by using vendor proprietary extensions such as "marginheight" (this is usually fixed by using CSS to achieve the desired effect instead).

This error may also result if the element itself is not supported in the document type you are using, as an undefined element will have no supported attributes; in this case, see the element-undefined error message for further information.

How to fix: check the spelling and case of the element and attribute, (Remember XHTML is all lower-case) and/or check that they are both allowed in the chosen document type, and/or use CSS instead of this attribute. If you received this error when using the <embed> element to incorporate flash media in a Web page, see the [FAQ item on valid flash](#).

 **Line 59, Column 11: element "script" undefined**

```
<scrip>
```

You have used the element named above in your document, but the document type you are using does not define an element of that name. This error is often caused by:

- incorrect use of the "Strict" document type with a document that uses frames (e.g. you must use the "Frameset" document type to get the "<frameset>" element),
- by using vendor proprietary extensions such as "<spacer>" or "<marquee>" (this is usually fixed by using CSS to achieve the desired effect instead).
- by using upper-case tags in XHTML (in XHTML attributes and elements must be all lower-case).

 **Line 62, Column 85: cannot generate system identifier for general entity "skin"**

```
...in a").attr('href',jq("#searchpagelogin a").attr('href') + "&skin=mobilewayf");
```

An entity reference was found in the document, but there is no reference by that name defined. Often this is caused by misspelling the reference name, unencoded ampersands, or by leaving off the trailing semicolon (;). **The most common cause of this error is unencoded ampersands in URLs** as described by the WDG in "[Ampersands in URLs](#)".

Entity references start with an ampersand (&) and end with a semicolon (;). If you want to use a literal ampersand in your document you must encode it as "&" (*even inside URLs!*). Be careful to end entity references with a semicolon or your entity reference may get interpreted in connection with the following text. Also keep in mind that named entity references are case-sensitive; &Aelig; and æ are different characters.

If this error appears in some markup generated by PHP's session handling code, [this article](#) has explanations and solutions to your problem.

Note that in most documents, errors related to entity references will trigger up to 5 separate messages from the Validator. Usually these will all disappear when the original problem is fixed.

 **Line 62, Column 85: general entity "skin" not defined and no default entity**

```
...in a").attr('href',jq("#searchpagelogin a").attr('href') + "&skin=mobilewayf");
```

This is usually a cascading error caused by a an undefined entity reference or use of an unencoded ampersand (&) in an URL or body text. See the previous message for further details.

 **Line 62, Column 89: reference not terminated by REFC delimiter**

```
...in a").attr('href',jq("#searchpagelogin a").attr('href') + "&skin=mobilewayf");
```

If you meant to include an entity that starts with "&", then you should terminate it with ";". Another reason for this error message is that you inadvertently created an entity by failing to escape an "&" character just before this text.

 **Line 62, Column 89: reference to entity "skin" for which no system identifier could be generated**

```
...in a").attr('href',jq("#searchpagelogin a").attr('href') + "&skin=mobilewayf");
```

This is usually a cascading error caused by a an undefined entity reference or use of an unencoded ampersand (&) in an URL or body text. See the previous message for further details.

 **Line 62, Column 84:** entity was defined here

```
...in a").attr('href',jq("#searchpagelogin a").attr('href') + "&skin=mobilewayf");
```

 **Line 68, Column 59: end tag for "input" omitted, but OMITTAG NO was specified** 

```
<input name="checkspelling" value="true" type="hidden" >
```

You may have neglected to close an element, or perhaps you meant to "self-close" an element, that is, ending it with "/>" instead of ">".

 **Line 68, Column 4:** start tag was here

```
<input name="checkspelling" value="true" type="hidden">
```

 **Line 69, Column 57: end tag for "input" omitted, but OMITTAG NO was specified** 

```
<input value="true" name="sethtftonly" type="hidden" >
```

You may have neglected to close an element, or perhaps you meant to "self-close" an element, that is, ending it with "/>" instead of ">".

 **Line 69, Column 4:** start tag was here

```
<input value="true" name="sethtftonly" type="hidden">
```

 **Line 73, Column 70: there is no attribute "placeholder"** 

```
...orminput" name="lookfor" id="lookfor" placeholder="Search Catalog" type="text">
```

You have used the attribute named above in your document, but the document type you are using does not support that attribute for this element. This error is often caused by incorrect use of the "Strict" document type with a document that uses frames (e.g. you must use the "Transitional" document type to get the "target" attribute), or by using vendor proprietary extensions such as "marginheight" (this is usually fixed by using CSS to achieve the desired effect instead).

This error may also result if the element itself is not supported in the document type you are using, as an undefined element will have no supported attributes; in this case, see the element-undefined error message for further information.

How to fix: check the spelling and case of the element and attribute, (Remember XHTML is all lower-case) and/or check that they are both allowed in the chosen document type, and/or use CSS instead of this attribute. If you received this error when using the <embed> element to incorporate flash media in a Web page, see the [FAQ item on valid flash](#).

 **Line 73, Column 99: end tag for "input" omitted, but OMITTAG NO was specified** 

```
...orminput" name="lookfor" id="lookfor" placeholder="Search Catalog" type="text" >
```

You may have neglected to close an element, or perhaps you meant to "self-close" an element, that is, ending it with "/>" instead of ">".

 **Line 73, Column 5:** start tag was here

```
<input class="forminput" name="lookfor" id="lookfor" placeholder="Search Ca...
```

 **Line 90, Column 109:** end tag for "input" omitted, but OMITTAG NO was specified 

```
...name="htftonly" checked="checked" type="checkbox"><span> Full view only</span>
```

You may have neglected to close an element, or perhaps you meant to "self-close" an element, that is, ending it with "/" instead of ">".

 **Line 90, Column 7:** start tag was here

```
<p;<input class="autowidth" id="fullonly" value="true" name="htftonly" check...
```

 **Line 91, Column 89:** end tag for "input" omitted, but OMITTAG NO was specified 

```
...indbutton" class="autowidth" name="submit" value="Find" type="submit"></p>
```

You may have neglected to close an element, or perhaps you meant to "self-close" an element, that is, ending it with "/" instead of ">".

 **Line 91, Column 4:** start tag was here

```
<input id="findbutton" class="autowidth" name="submit" value="Find" type="su...
```

 **Line 98, Column 14:** element "script" undefined 

```
<scrip>
```

You have used the element named above in your document, but the document type you are using does not define an element of that name. This error is often caused by:

- incorrect use of the "Strict" document type with a document that uses frames (e.g. you must use the "Frameset" document type to get the "<frameset>" element),
- by using vendor proprietary extensions such as "<spacer>" or "<marquee>" (this is usually fixed by using CSS to achieve the desired effect instead).
- by using upper-case tags in XHTML (in XHTML attributes and elements must be all lower-case).

 **Line 101, Column 84:** reference not terminated by REFC delimiter 

```
...rlogin a").attr('href',jq("#footerlogin a").attr('href') + "&skin=mobilewayf");
```

If you meant to include an entity that starts with "&", then you should terminate it with ";". Another reason for this error message is that you inadvertently created an entity by failing to escape an "&" character just before this text.

 **Line 101, Column 84:** reference to entity "skin" for which no system identifier could be generated 

```
...rlogin a").attr('href',jq("#footerlogin a").attr('href') + "&skin=mobilewayf");
```

This is usually a cascading error caused by a an undefined entity reference or use of an unencoded ampersand (&) in an URL or body text. See the previous message for further details.

 *Line 62, Column 84:* entity was defined here

```
...in a").attr('href',jq("#searchpagelogin a").attr('href') + "&skin=mobilewayf");
```

 *Line 106, Column 8:* end tag for "br" omitted, but OMITTAG NO was specified 

```
<br:.....
```

You may have neglected to close an element, or perhaps you meant to "self-close" an element, that is, ending it with "/>" instead of ">".

 *Line 106, Column 4:* start tag was here

```
<.....br>
```

 *Line 108, Column 8:* end tag for "br" omitted, but OMITTAG NO was specified 

```
<br:.....
```

You may have neglected to close an element, or perhaps you meant to "self-close" an element, that is, ending it with "/>" instead of ">".

 *Line 108, Column 4:* start tag was here

```
<.....br>
```

 *Line 111, Column 33:* element "script" undefined 

```
<script type="text/javascript">.....
```

You have used the element named above in your document, but the document type you are using does not define an element of that name. This error is often caused by:

- incorrect use of the "Strict" document type with a document that uses frames (e.g. you must use the "Frameset" document type to get the "<frameset>" element),
- by using vendor proprietary extensions such as "<spacer>" or "<marquee>" (this is usually fixed by using CSS to achieve the desired effect instead).
- by using upper-case tags in XHTML (in XHTML attributes and elements must be all lower-case).

 *Line 115, Column 33:* element "script" undefined 

```
<script type="text/javascript">.....
```

You have used the element named above in your document, but the document type you are using does not define an element of that name. This error is often caused by:

- incorrect use of the "Strict" document type with a document that uses frames (e.g. you must use the "Frameset" document type to get the "<frameset>" element),
- by using vendor proprietary extensions such as "<spacer>" or "<marquee>" (this is usually fixed by using CSS to achieve the desired effect instead).
- by using upper-case tags in XHTML (in XHTML attributes and elements must be all lower-case).

 **Line 122, Column 8: no document element**



`</html>`

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