Omeka Everywhere:
Connecting Online and In-Person Museum Experiences

Research Report by Andrew Wolf and Clarissa J. Ceglio, PhD

Abstract

Omeka Everywhere unites and extends the capabilities of two widely used open-source software platforms: Omeka Classic, a content management system for web publishing, and Open Exhibits, which brings gesture-responsive, interactive experiences to in-gallery touchscreen displays. The Omeka Everywhere suite of tools includes a Collections Viewer, mobile app, and Heist. The latter allows gallery goers to sync their personal mobile devices to the in-gallery digital display so that they can save, share, and reference favorited collections material during and after their visits. This report details how findings from two phases of usability testing conducted over the three-year development period informed the iterative refinement of the Omeka Everywhere user interface and experience (UX/UI). Primary outcomes included tailoring the Omeka Everywhere experience to potential users' accustomed touchscreen behaviors, expectations regarding ease of use and response times, interpretations of interface icons, and desired features. The data also suggest there would be value in evaluating Omeka Everywhere as a teaching tool for collections-based research projects in collaboration with college museums or archives.

Co-author and Undergraduate Researcher Andrew Wolf received his Digital Media and Design degree from the University of Connecticut in May 2018. Clarissa J. Ceglio, PhD, is Assistant Professor of Digital Humanities in the Digital Media & Design Department of the School of Fine Arts at the University of Connecticut.

Introduction

From the smartphones that visitors bring with them, to tabletop and wall-mounted digital displays in the galleries, encounters with touchscreen technologies in the museum have become a common way of engaging with collections materials. Likewise, museums share collections with the public beyond their doors through institutional websites and social media networks. A growing number of visitors anticipate, even expect, to be able to move fluidly between these on-line and in-gallery options, between personal mobile devices and museum-based displays.[1]

For the professionals creating and maintaining these digital experiences, however, the behind-the-screens reality is not so seamless. Often, content contained in systems designed specifically for in-gallery hardware cannot be easily shared with online content management systems (CMS)—and vice versa. In fact, in late 2013, 78% (79/101) of museum professionals from institutions of different genres and sizes reported they did not have web content management systems that could communicate with their in-gallery exhibit components.[2] Further, 69% (70/101) "wish[ed] it was possible," and nearly 100 percent of the survey participants indicated that they would be more likely to share their online content with in-person visitors in a computer-based exhibit if there was an "easy and inexpensive way" to do so.

Not surprisingly, museums want to make the process of creating, sharing, and distributing digital content more streamlined, cost-effective, and less labor-intensive. One major step in achieving those goals is for their software to be interoperable, free, open source, and easy to use. Understanding these needs and challenges, George Mason University's Roy Rosenzweig Center for History and New Media (RRCHNM), Ideum, and the University of Connecticut's Digital Media & Design Department (UConn DMD) developed Omeka Everywhere http://omeka.org/everywhere/. This new suite of interactive tools, made possible by a grant from the Institute of Museum and Library Services, draws together the strengths of two free and widely adopted collections-based open-source software projects: Omeka Classic omeka.org, a web-publishing platform for the display of collections materials in online exhibition formats, and Open Exhibits openexhibits.org, a human-computer interaction (HCI) initiative that focuses on visitor-driven collections display experiences that are physically as well as socially engaging. With Omeka Everywhere, content—entered once and easily altered and updated as needed—can be displayed online as well as on gesture-responsive mobile devices and in-gallery multitouch screens.
The suite consists of three components:

- The Collections Viewer, which allows individuals, alone or in groups, to find items by keywords, zoom in on images, and, at the touch of a finger, access a dropdown text box to learn more about the item being examined
- A mobile app that optimizes viewing for smartphone and tablet screens while also allowing users to "favorite," or like, collections' items and to share content to social media
- Heist, which allows individuals to save selected items from a digital exhibit in the museum to their personal devices so that they can access and share collections material after the visit

This report summarizes the findings of usability tests conducted by UConn DMD at two different points during the three-year-long iterative development of

---

[1] Increased ownership of touchscreen personal devices, e.g., smart phones and tablets, and access to public Wi-Fi has habituated visitors to expect personal interactivity from in-gallery experiences, according to Bruce Wyman, Scott Smith, Daniel Meyers, and Michael Godfrey, "Digital Storytelling in Museums: Observations and Best Practices," *Curator: The Museum Journal* 54, no. 4 (October 1, 2011): 461–68. Similarly, Loïc Tallon underscores that "mobility and connectivity are fundamental expectations" of gallery visitors today in: "Introduction: Mobile, Digital and Personal," in *Digital Technologies and the Museum Experience: Handheld Guides and Other Media*, eds. Loïc Tallon and Kevin Walker (Lanham: AltaMira Press, 2008), xvii.

[2] "In-Gallery Experiences and Content Management Systems" Survey Summary, conducted by the Roy Rosenzweig Center for History & New Media, Ideum, and UConn Digital Media & Design Department (2013), 6. Provided to IMLS 2014. Data on file.

the Omeka Everywhere tool suite. This formative feedback enabled the design and development teams at RRCHNM and Ideum to more effectively align Omeka Everywhere's content delivery and presentation strategies with potential users' habits, interests, and expectations.[3] The plans for both the Phase I and Phase II research followed best practices as articulated by a range of usability testing experts.[4]

Phase I: The Collections Viewer

Methods

In November of 2015, the team conducted Phase I usability testing of the Collections Viewer in collaboration with UConn's Archives and Special Collections (ASC). ASC staff populated an Omeka Classic website with highlights from its diverse holdings and set a loaned, platform-style touchtable in the ASC's glassed-walled entry foyer in a spot typically occupied by an object display case featuring rotating mini-exhibits of collections materials. Goals included evaluating the intuitiveness of the user interface in relation to available user actions, identifying any bugs in functionality, and ensuring the system performed as well with four simultaneous users as with just one. For its part, ASC wished to learn how the interactive experience might engage student learners, particularly those who had never been to an archival repository or who had limited experience using archival materials. Evaluation methods included pre- and post-visit online surveys as well as in-person usability tests. The latter consisted of moderator observation as participants interacted with the beta version of the Omeka Everywhere interface (Figures 1 and 2) while offering "think-out-loud" narration of their experience and reactions.

Thirty respondents, self-identified as 17 female and 13 male, ages 18-27, participated in 10 solo user, 2 pair (n=4), and 4 quartet (n=16) in-person usability test sessions at the ASC. One-third of respondents described themselves as Latino(a) or Hispanic, African American/Black, Asian/Asian American, or as "Multiple Ethnicities." All owned or had used a touchscreen phone and/or tablet and had familiarity with basic hand gestures for touchscreen commands. Only one-quarter of the 30 had previously visited or used archives. Those who had never been to one imagined them to be "old, full of information" and, based on comparisons to their own use of blog or news site archives, understood that they were useful for research.

Findings

The most frequent unsolicited response from participants during the observation sessions was, "Wow!" The exclamation accompanied users' discovery that high-resolution images could be enlarged to dimensions that exceeded the physical bounds of the roughly 25-by-43-inch table top. The ability to examine handwritten documents, photographs, and other materials in such fine-grain detail also earned the most favorable comments on the post-test session survey in response to the question, "What aspect of the Omeka Everywhere touchtable experience did you find most rewarding?" Said, one respondent, "I think the ability to manipulate the images without the fear of damaging them that can be present when working with historical documents. Additionally the ease in enlarging the image to notice details was helpful."

Equal to participants' delight in the ability to zoom in and scrutinize details in primary sources was their disappointment at the fuzzy results yielded by files uploaded at the standard web-acceptable resolution of 72 dpi. Digital files of at least a quarter of the resolution of the touch table screen resolution should be used in order to fully utilize the capabilities that

---

[3] Chris Creed, Joseph Sivell, and John Sear, "Multi-touch Tables for Exploring Heritage Content in Public Spaces" in *Visual Heritage in the Digital Age*, eds. Eugene Ch'ng, Vincent Gaffney, and Henry Chapman (London: Springer: 2013), 67-90.

[4] Jakob Nielsen, *Mobile Usability* (Berkeley: New Riders, 2012) and *Designing Web Usability* (Berkeley: New Riders, 2000); Steve Krug, *Don't Make Me Think!: A Common Sense Approach to Web Usability* (Berkeley: New Riders Pub., 2006); Joseph S. Dumas and Janice Redish, *A Practical Guide to Usability Testing* (Portland, OR: Intellect Books, 1999); and Usability.gov, http://www.usability.gov/.

Figure 1: The beta version screen of the Omeka Everywhere interface featured a browsing “tray” on each side of the table and a subtle grid pattern in the main display area or “stage.” Users could sort and filter collections using up to three preassigned tags as shown in this photo of the table installed at ASC.

high-definition, large-screen touch tables provide. Generally, images of at least 500 pixels wide for High Definition (HD) and 1,000 pixels wide for Ultra-high Definition (UHD) displays are recommended. Also, institutions that utilize the .JPEG2000 and/or .TIFF file formats for archival purposes will want to upload collections materials as .JPEG files, which both Omeka Classic and the Omeka Everywhere extension support. Omeka Classic handles the standard digital image file formats .JPEG, .TIFF, and .GIF, which are widely supported for efficient public display and rendering, better than it does .JPEG2000 files.

To broaden its institutional user base, future iterations of the table software would benefit from supporting .TIFF files—something which Omeka Classic already does. The ASC had populated its Omeka Classic instance with .TIFF files, the format it and similar institutions use to ensure visibility of object details when “zoom” functionality is an element of the user interface. Unfortunately, because the table software did not support this format, the .TIFF files did not display. To support the beta testing effort, ASC staff converted a large enough portion of the initial files to the table-required .JPEG format but with some resulting quality loss that comes with data compression. Going forward, implementing .TIFF compatibility would streamline workflows for institutional users of .TIFF files, making it easier for them to meet the goal of providing crisp, legible object detail at the high levels of magnification that is one of the chief features that participants said they most appreciated about the table interface.

Users also prized the ease with which they could enlarge and compare different items side by side. For

sorting through the collection and quickly identifying items of interest, respondents described the tags as helpful; many also wished they could search the collection using a word or phrase and, in fact, several suggested this as a feature that would improve their experience. Additionally, a majority indicated, unprompted, that they wanted to be able to save items from their searches. This expression of interest provided early confirmation of the user value inherent in the mobile app and Heist, which were then in development. Both make it possible for museumgoers to identify, save, and share items discovered using the in-gallery Collections Viewer.

Bugs in the beta version proved to be few, with only two system crashes. These occurred during the multi-user sessions (one pair and one quartet), which had been intended as “stress” tests (see Figure 1 where error message appears center-left). Core learnings that influenced refinement of the Collection Viewer’s user interface included discovering that many respondents interpreted the faint but visible grid pattern on the stage area of the screen as a cue to size and align their chosen items to its boundaries (Figure 2). Also, users found that items placed on stage faded from sight too quickly if they turned their attention (and touch) to other items. They wanted their chosen materials to remain accessible for a longer period of time so they could explore at a more comfortable pace. The evaluations found the simple screen instructions and icons adequate for users’ needs with the exception of the “results” bar. For example, after a user selected a tag by which to filter the collection, the results bar display might read “19 of 151” (Figure 1). Users interpreted this to mean their search had yielded 151 items and did not understand why they could only see the “first” 19. The designers’ intention, however, had been to communicate that out of 151 total items in the entire collection, 19 matched the tag search criteria. Many users also missed the information icon that appeared discreetly in the corner of each image. Therefore, they did not know they could tap and, thereby, “flip the image over” to reveal its metadata (Figure 2, #2). This and similar input guided the Collections Viewer redesign that debuted during Phase II testing (Figure 3).

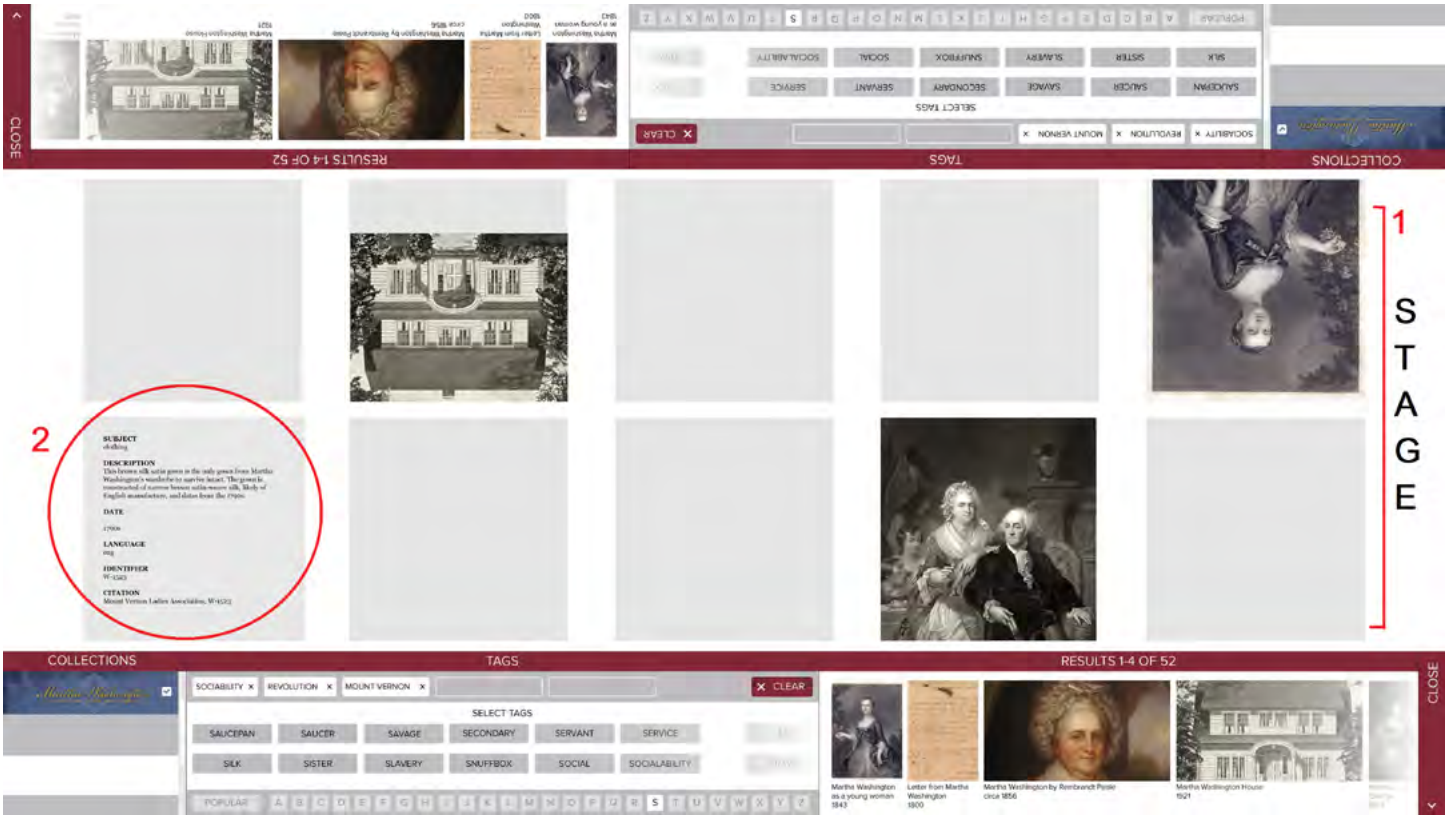

Figure 2: Users of the Omeka Everywhere beta could drag items of interest from the tray onto the stage (1 in this design wireframe). There, they could zoom, resize, and “flip over” images in order to access associated metadata (2).

As to the participants who had not previously visited or used archives, about half (12/23) exited the Omeka Everywhere experience with a new sense of possibility and interest. Said one, “I think this is a really cool way to look at archives. It puts the information in a new media platform and makes it engaging to the user.” Another noted, “I thought it was really cool, it was an interactive way of getting people who may not necessarily be interested in archives to get them to want to look through them.”

Phase II: The Mobile App, Collections Viewer and Heist

Methods

In Spring 2017, the team conducted Phase II usability testing of the full Omeka Everywhere tool suite in collaboration with the William Benton Museum of Art, located on UConn’s main campus, and the Archives and Special Collections. A DMD undergraduate researcher populated an Omeka Classic website with materials from the ASC’s Ellen Emmet Rand Papers in preparation for the usability testing to occur within the context of the Benton’s exhibition “Work It: Women Artists, Ellen Emmet Rand and the Business of Seeing.”[5] Omeka Everywhere ran on a loaned, four-person platform-style touchtable installed in the museum’s intimate Center Gallery with works by Rand and such contemporaries as Dorothea Lange and Violet Oakley. Here, it allowed visitors to explore materials documenting Rand’s business, artworks, awards, and personal life. This complemented the exhibition’s core focus on the complexity of careers for women artists who had to pay bills, support families, gain visibility for their work, and, all the while, navigate gendered social expectations.

Goals for Phase II included assessing the refined

[5] “Work It: Women Artists, Ellen Emmet Rand and the Business of Seeing” (March 23-July 30, 2017), https://benton.uconn.edu/2017/02/23/work-it-women-artists-ellen-emmet -rand-and-the-business-of-seeing/. See also Kristin Eshelman and Patrick Butler, “A Guide to the Ellen Emmet Rand Papers,” http://archives.lib.uconn.edu/islandora/object/20002:860257637 and Archives and Special Collections, Digital Collections, “Ellen Emmet Rand Papers,” http://archives.lib.uconn.edu/islandora/object/20002%3A20150071?page=1&display=list.

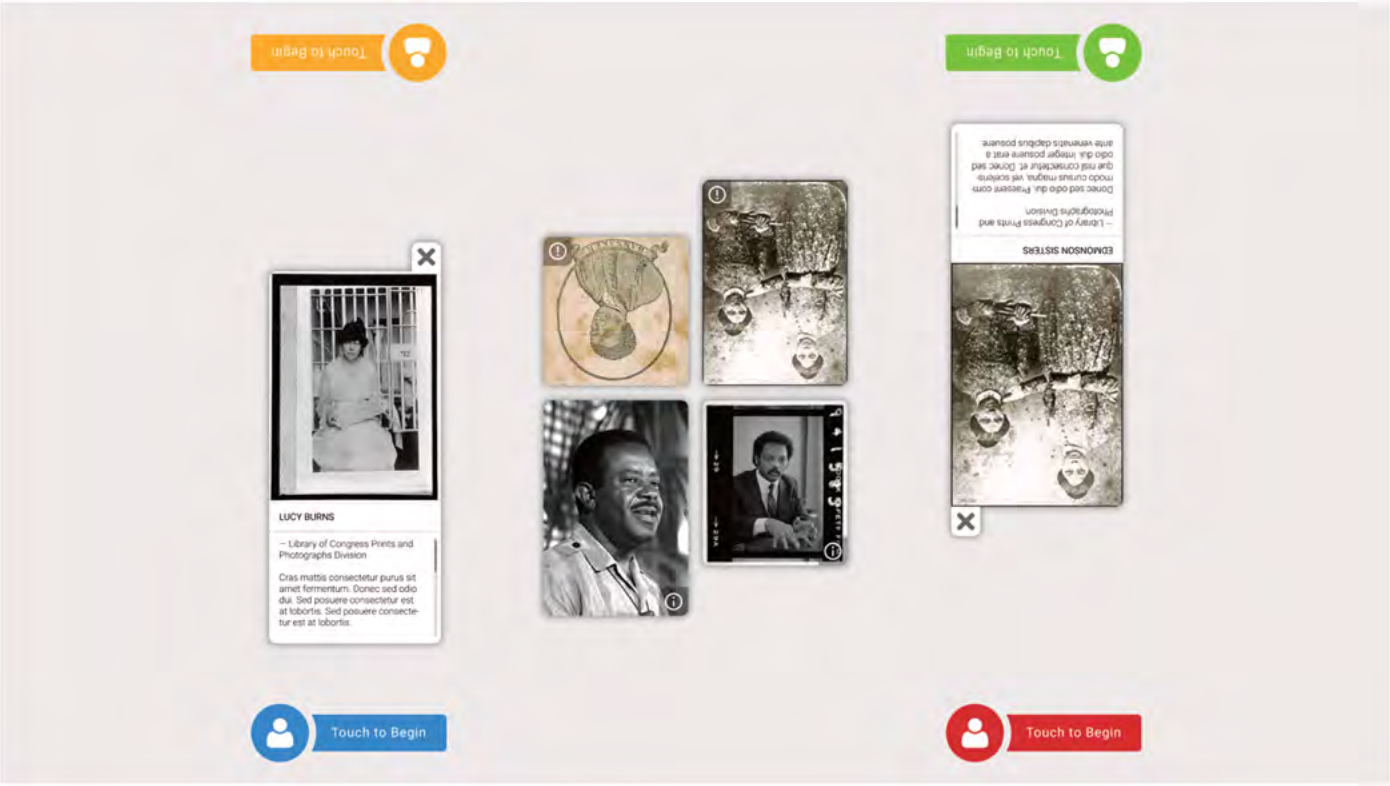

Figure 3: Guided by Phase I user feedback, the second iteration of the Collections Viewer interface featured a roomy, uncluttered space for engagement. To initiate a session, users could either tap a “Touch to Begin” station (seen here, clockwise from upper left, in orange, green, red, and blue) or an item on the stage.

Collections Viewer User Interface and User Experience UX/UI (Figure 3), evaluating the beta version of the mobile app UX/UI (Figure 4), and testing the Heist feature, which allows museumgoers to transfer and save items of interest from the in-gallery Omeka Everywhere display to their personal mobile device. The Benton, for its part, sought input on visitor-perceived benefits of a digital in-gallery experience designed to augment the physical exhibit.

For the first arm of the Phase II testing, the team used the UX research platform Lookback to enable unmoderated self-testing of the mobile app.[6] Participants received a set of instructions to download the beta version Omeka Everywhere mobile app to their personal device along with the Lookback app. With respondents' consent, Lookback records users screen interactions, facial expressions, and "think-out-loud" narration of their experience and reactions as they execute a set of tasks provided by the research team. This approach allowed respondents the flexibility to participate using their own smartphone at a time and place convenient to them while also enabling the team to assess ease of app download. Ten individuals ages 20 to 61 (self-identified as 7 females and 3 males; 9 White/Caucasian and 1 Latino(a)/Hispanic) participated. All had a pattern of museum visitation, ranging from occasional visits more than 12 months apart (1), to once yearly (3), to 2-3 times a year (3) and to more than three times per annum (3). Nine indicated that they had at least one app downloaded to their mobile phone that they used for "self-education" (compared to the greater number each had for entertainment and social connection).

Test methods for the second arm, which evaluated the Collections Viewer in conjunction with Heist and the mobile app, included pre- and post-test online surveys and in-person usability tests; these followed the protocols used in Phase I. Six individuals, four self-identified as White/Caucasian, one as Latino(a)/Hispanic, and one as "Multiple Ethnicities,"

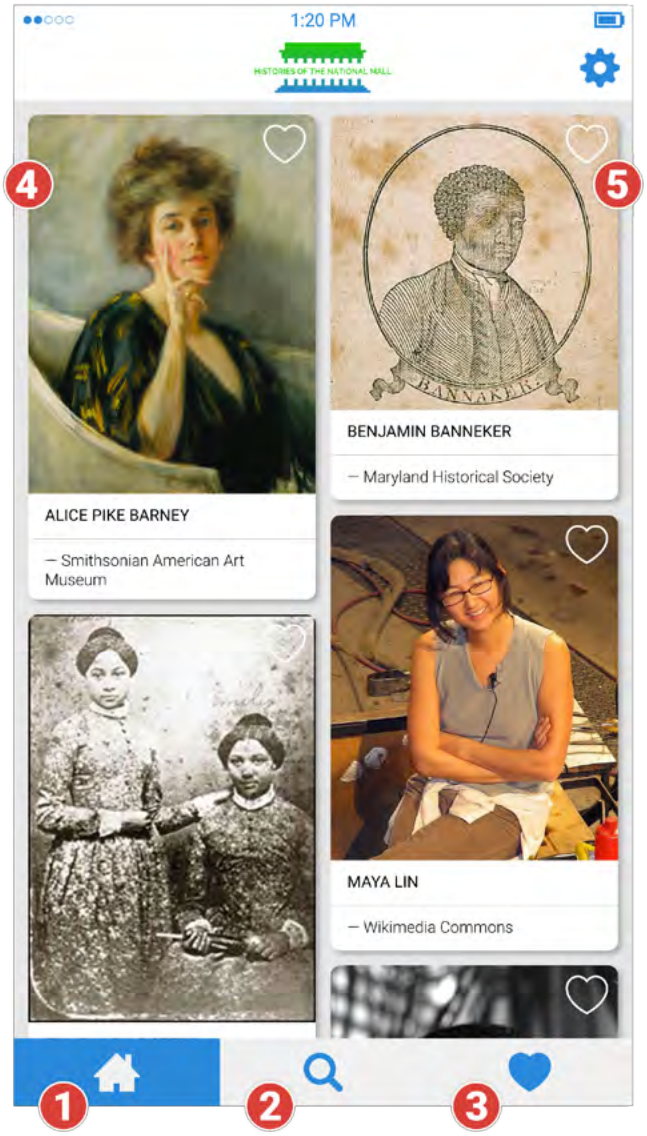

Figure 4: The beta design of the Omeka Everywhere mobile app utilized widely familiar icons to indicate access to such features as settings, home (1), search (2), and favorites (3). Users could also tap on an image (4) to access the associated item page with contextual information and object metadata. Additionally, each image featured a heart icon that users could tap to like an item, thereby adding it to their personalized sub-collection of favorited items (5). To remove a previously favorited item from this subset, users simply need tap its darkened heart icon to "unlike" it. Users can toggle between a list or grid view (shown here). Content shown here and used for the mobile app UX/UI usability testing was drawn from Histories of the National Mall <mallhistory.org>, an Omeka Classic-based public history project of RRCHNM.

[6] During the test period, the Omeka Everywhere mobile app was only available in an android beta version. The released version is available for download from both Google Play and the iOS App Store.

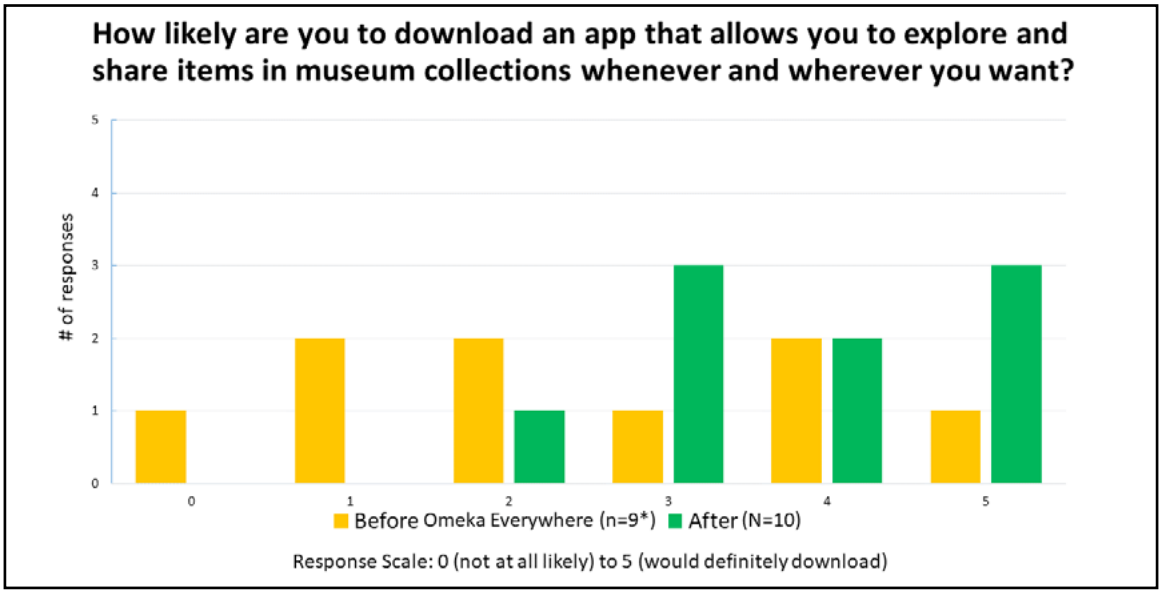

Figure 5: The number of respondents who perceived value in an app that would allow them to access, explore, and share museum collections' items on demand increased, as shown in green, after they had used the beta version of Omeka Everywhere.

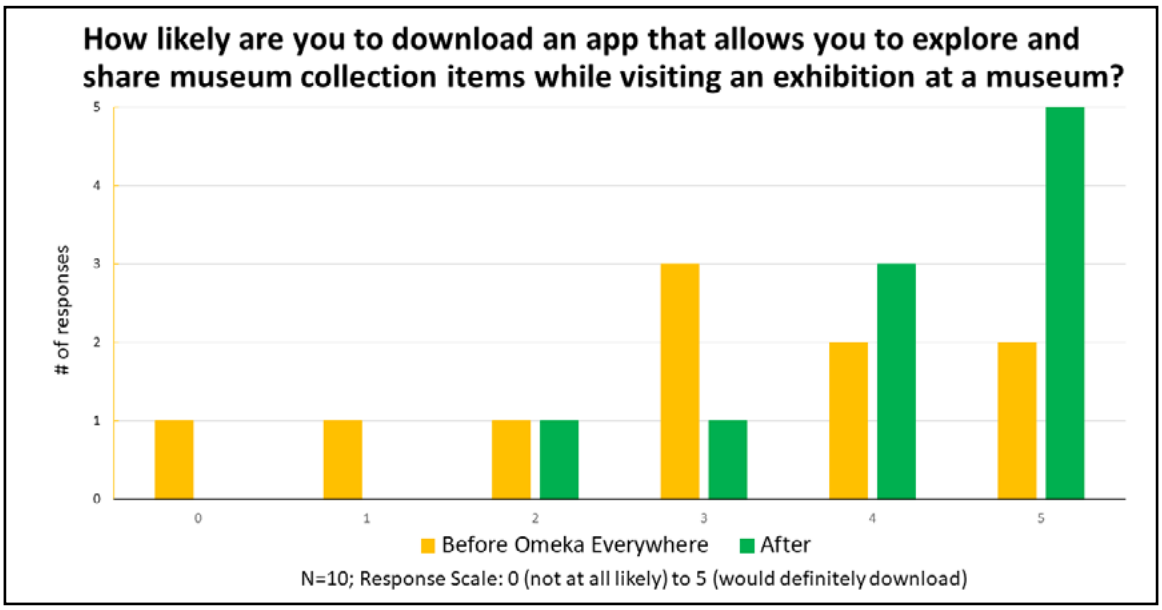

Figure 6: Respondent interest in using a collections app when visiting a museum exhibition rose dramatically, as shown in green, after their test experience with, the beta version Omeka Everywhere app.

participated in this arm of the study and ranged in age from 19 to 47. Four of the six self-identified as female and two as male. All of the participants had experience with touch screen technology and utilized at least one app for self-education purposes. The majority were frequent museumgoers, visiting two to three times per year (2/6) or more than three times annually (3/6).

Findings

Prior to the mobile app test sessions, respondents were asked two questions designed to gauge general interest in the functionality Omeka Everywhere provides. The post-session survey, which posed the same two queries, revealed that users' interest in downloading an app with Omeka Everywhere's capabilities had dramatically increased as a result of simply testing the app in a scenario independent of a museum visit (see Figures 5 and 6).

Assessments of the overall experience described it as "Intuitive, it used common, well understood icons, got me to what I wanted to know very quickly" and "I liked that you can save items for later and just have content that appeals to you alone." The most substantive feedback in terms of guiding revision of the app's interface centered on the Item View page (Figure 7, #3). Wanting to enlarge the presented image, most users either tapped or used a spreading apart motion of the thumb and index finger. When the image remained unchanged after repeated attempts, they signaled frustration through both body and spoken language. Most missed the "expand" icon situated in the upper right corner of each image (Figure 7, #3), which, when tapped, brought users to a full screen image allowing both panning and zooming. A similar button allowed for exit. In part, users missed this feature because they were not looking for it, defaulting instead to habitual gestures associated with the desired action. Also, low contrast between the icon, rendered as a blue outline, and many of the collection images made its presence difficult to discern.

The ability to sort collections material by tags proved intuitive, with users commenting on this feature's ability to encourage exploration and discovery. Said one, "I like the tags feature because it suggests topics to the app user (who might not be sure what they want to look at)."

The second arm of Phase II usability testing, which occurred in the William Benton Museum of Art, allowed the respondents to experience the full Omeka Everywhere tool suite: the Collections Viewer with Heist functionality and the mobile app (pre-installed on smart phones loaned to participants). Prior to the in-gallery experience, respondents indicated that they were "likely" to "very likely" to explore touchscreen technology if available in a museum exhibit (average likelihood 4.5).[7] Fewer indicated that they would be likely to download an app that would allow them to

Figure 7: Certain visual cues on the Item View page of the beta version of the app proved confusing to respondents. The "return" arrow (1) led, as intended, to the main feed, or home page; however, users who had come to the Item View page by a different path and wanted to "go back" to their previous page found this frustrating. Also, the "share" icon, rendered as an ellipse (2), was interpreted as signaling "more options" or "more information" rather than as an invitation to share materials via social media or e-mail. Lastly, many respondents intuitively tapped or used a spreading gesture to attempt enlarging the featured image and missed the "expand" icon (3) altogether.

explore and share museum collection items while visiting an exhibition (See Figure 8 yellow responses; average likelihood 2.3). As with the mobile app-only testing, participants' desire to download and use an app like Omeka Everywhere increased appreciably after they tested the app. Here, it rose from an average likelihood of 2.3 beforehand to 3.8 after use (See Figure 8 green responses). Average likelihood of respondents using an in-gallery touchtable, which had been high pre-visit (4.5), remained about the same (4.3).

[7] Responses for this and the subsequent data comparisons are provided on a 0-to-5 scale with 0 being "Unlikely" and 5 being "Very likely." Unless noted, N=6.

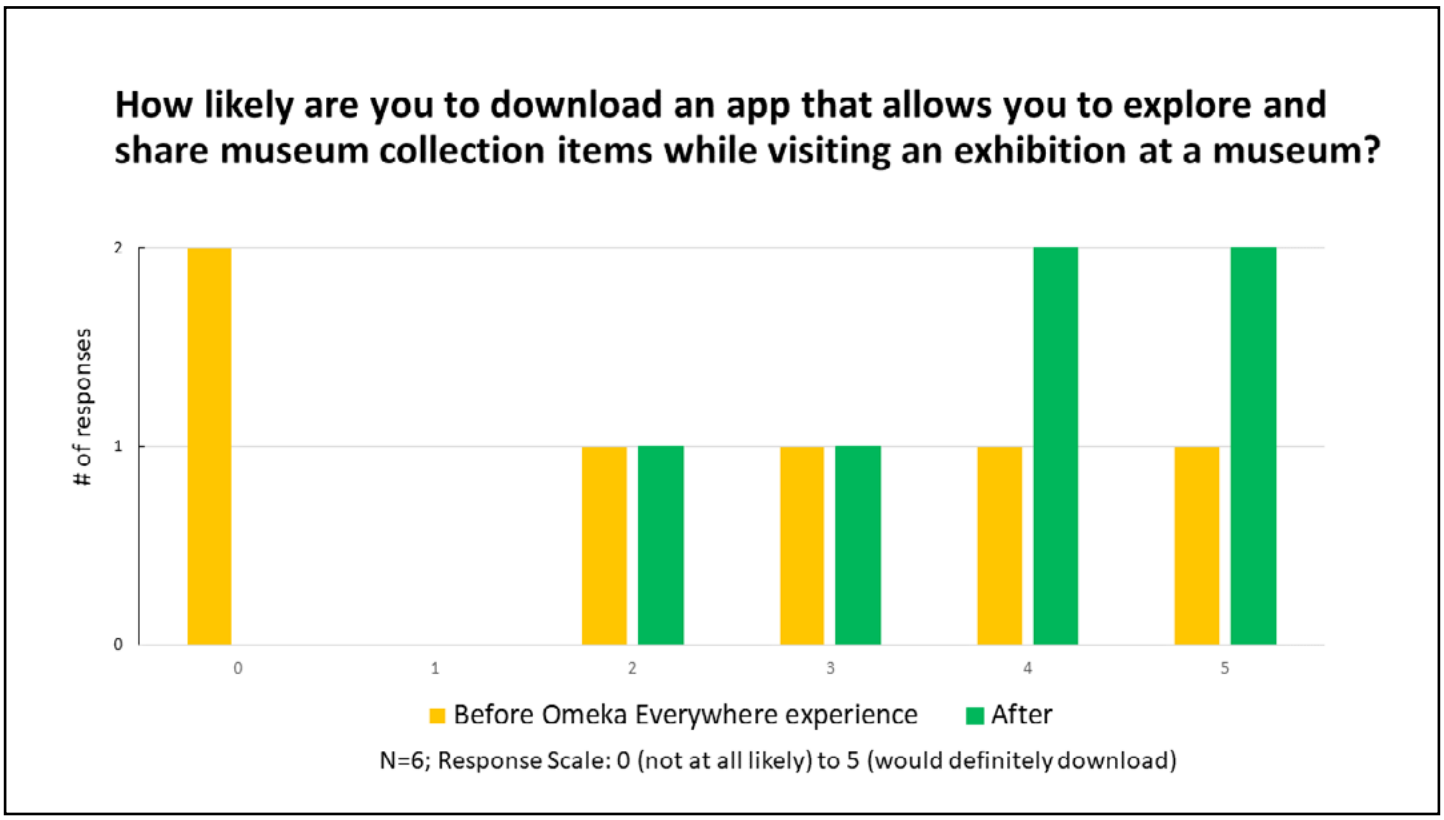

Figure 8: Users' in-gallery test experience with Omeka Everywhere (green) increased their interest in downloading and using such an app in the future, as shown here in comparison to their pre-test baseline (yellow).

Feedback that most influenced the design changes implemented for the publically released version of the Collections Viewer included shifting to use of a single color for the "touch to begin" stations (Figure 9). Initially, each station was rendered in a different color to create a vibrant, inviting start screen (Figure 3). Respondents, however, sought to attach meaning to this difference, guessing it meant that each station offered a separate collection or set of materials—or that the colors would "play against one another" in a competitive game scenario. Another element new to the updated interface that users found frustrating was the automatic 180-degree rotation of images when they crossed the table's centerline. Intended to allow back-and-forth sharing by users on either side of the table, it proved an unwelcome surprise for single as well as paired users. "It freaks me out that it flips upside down; it is creating anxiety," said one participant. Another noted, "The flipping seems useless if there is no one on the other side. Can't it [the table] tell?"

The released version of Omeka Everywhere foregoes this automatic rotation feature and, instead, allows users to manually rotate images and retain control of sharing activities. Phase II testing also confirmed that changes made in response to Phase I user feedback—longer dwell time for items placed on the main stage, removal of the background grid pattern, and option to display the object and its associated information simultaneously—had Increased satisfaction with the UX/UI. As with Phase I, respondents expressed awe and delight at being able to zoom in on high-resolution images and compare different images side by side. Feedback on the mobile app proved consistent with that from the first arm of the study, leading to refinements in the released version (Figure 10).

In response to the Heist feature, which allows users to select a collections' item from the table and upload it to the Omeka Everywhere app on their smartphone, respondents readily articulated its perceived value. "It's cool that I could take part of the exhibit with

me," said one, a graduate student, "That'd be good for research." Another commented, "It's so cool to have it [the app] on your own phone and for free. I could put stuff on my phone and not feel like I was hogging the table if other people were here." The process of pairing one's phone to the table proved to be easy, with respondents guided by simple step-by-step instructions provided by the Collections Viewer interface. They noted that the experience could be improved by increasing the time that the user-specific 4-digit code required for table-phone pairing and the confirmation message signaling a successful upload remained on the screen. In response to this feedback, the design and development team eliminated the manual steps required by the beta version's four-digit pin with an easy-to-scan QR code (Figure 9).

Conclusion

Released in April 2018, the Omeka Everywhere suite is the outcome of an iterative design process that incorporated formative evaluations to thoughtfully align the software's presentation strategies and features with potential users' expectations and touchscreen habits. As shown here, respondent feedback guided instrumental changes to the UX/UI that improved the intuitiveness, ease, and perceived value of the in-gallery and mobile app encounters. Carefully-designed user testing regimens are key to implementing technologies that match both users' and museum professionals' needs.

Given that both widely-adopted software products have already benefited from years of feedback from digital cultural heritage administrative users, the team focused on the public end-users for its evaluations. The chief purpose of usability testing, such as that reported here, is to identify how the design of specific digital interfaces—and the experiences they provide—can be made more effective. Considerations include functional elements, such as how easily respondents can navigate the available activities,

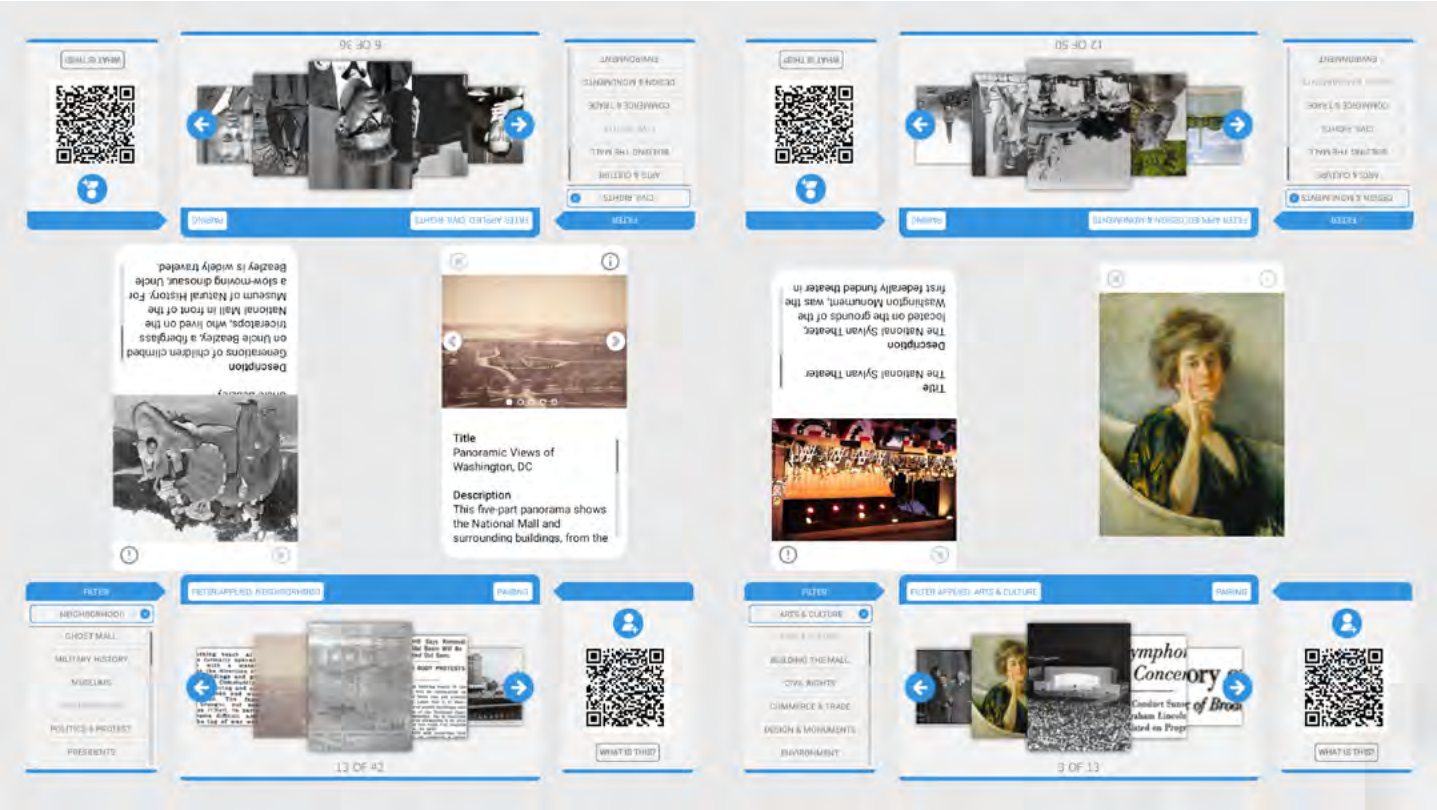

Figure 9: The released Omeka Everywhere Collections Viewer with Heist, shown here with its four visitor stations opened and in use, allows institutions to connect an Omeka Classic instance to a multitouch table or device. The Omeka Everywhere Collection Viewer uses the Omeka API to pull a chosen repository into an interactive experience without having to re-enter any metadata. Modifications based on user feedback include a consistent color for all "Touch to Begin" stations, shown here in the open carousel mode that facilitates rapid scrolling through all or tag-filtered collections items.

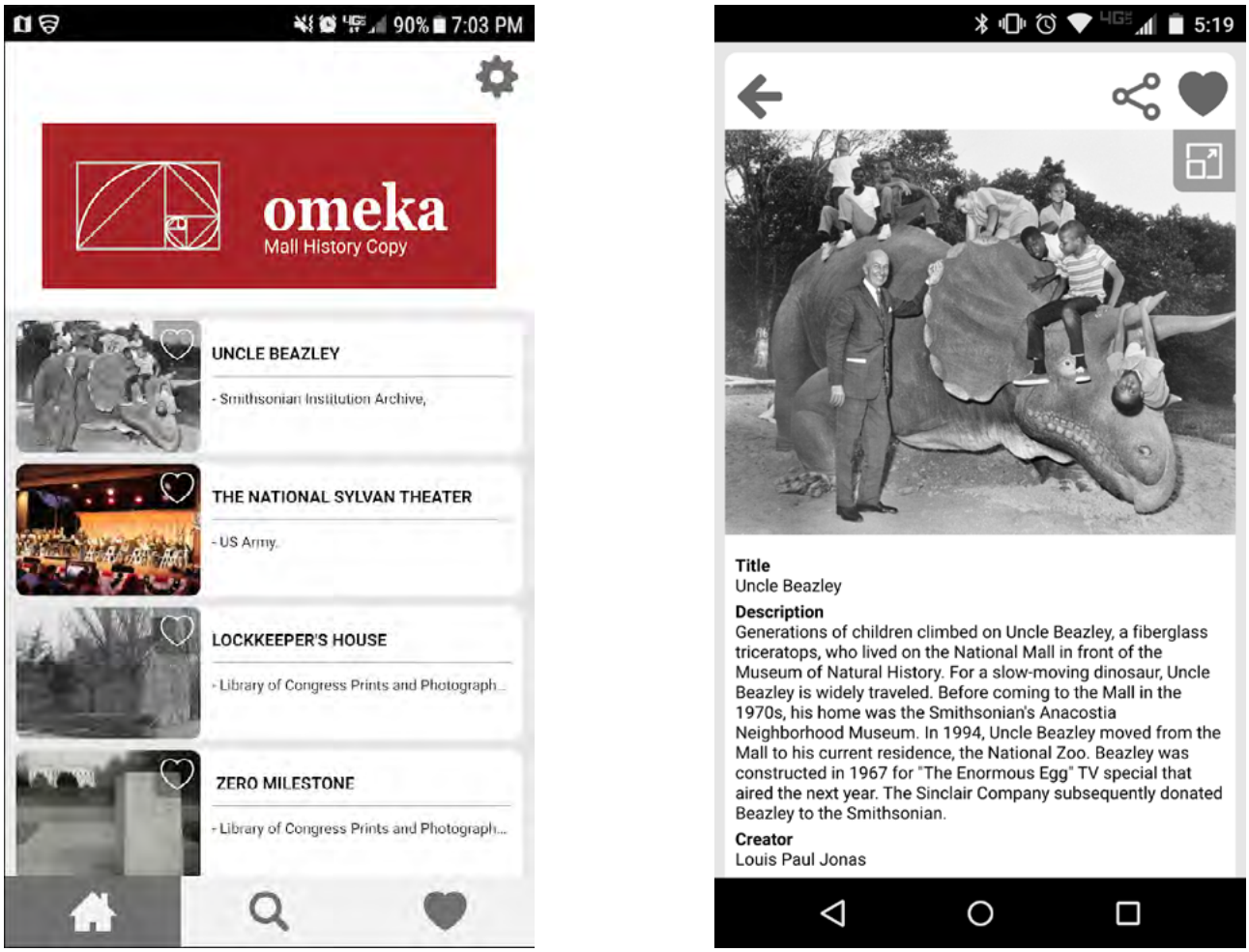

Figure 10: The released version of the Omeka Everywhere mobile app for android and iOS allows users to choose between a grid or list view (shown here, left). Enhancements to the Image View page (right) based on user feedback include increasing contrast and visibility of the "expand" icon and adopting the most popular "share" icon.

as well as emotional factors, such as satisfaction and delight. Testing is conducted concurrent with software development so that if any issues related to the interface and interactions surface they can be addressed quickly and efficiently. The project team employed Steve Krug's method of testing early and often with small groups of respondents, an approach intended to yield "actionable [design] insights, not proof" of broadly applicable user behavior.[8] As reported, the gathered data led to strategic changes to the user interfaces and functionality of the various Omeka Everywhere components.

The data also revealed an area of potential future study. Since the evaluations took place on a campus setting, with all but one respondent studying at or employed by the university, it is not surprising that a number of them mentioned the perceived utility of Heist and the mobile app as tools for research or teaching. Future work might pilot collections-based research projects that involve students in using the Omeka Everywhere suite on their mobile devices, in their college museum (or archives), and in the classroom. As broader studies continue to suggest, semi-structured experiences with personal mobile devices can result in longer exhibition dwell times, more time spent with in-gallery text, and higher scores for mindfulness and perceived learning.[9]

[8] Krug, 119.

[9] Karen Hughes and Gianna Moscardo, "Conecting with New Audiences: Exploring the Impact of Mobile Communication Devices on the Experiences of Young Adults in Museums," *Visitor Studies* 20, no. 1 (2017):33-55.

Institutions without access to touch tables might easily experiment with wall- or pedestal-mounted tablets. Certainly, the Ideum and Omeka teams will encourage future adopters of the suite of tools, particularly in public history, museum studies, and library science communities, to incorporate these tools and workflows into student group projects.

The debut of the Omeka Everywhere suite represents a successful collaboration between two free, open software projects designed to serve the needs of museums and cultural heritage institutions. It is hoped that the effort's benefits to the field will inspire other organizations to create crosswalks and pathways within the museum technology sector. This report also offers a model for how to conduct usability research at an individual institution that then feeds into the design and development of open-source software. Most important, Omeka Everywhere represents new opportunities for cultural heritage institutions of modest size and limited budgets to engage communities in collections discovery, both onsite and at home. Omeka Everywhere achieves this goal by connecting online content management systems with in-gallery experiences in a way that streamlines workflows, rather than increases the workloads, of busy professionals so that they can focus on expanding user engagement with collections.

Acknowledgments

Omeka Everywhere is a collaboration between the Roy Rosenzweig Center for History and New Media (RRCHNM), Ideum, and the University of Connecticut's Digital Media and Design Department, made possible by a grant from the Institute of Museum and Library Services. This research was also supported by a 2017 Social Sciences, Humanities, and Arts Research Experience (SHARE) Award to Mr. Wolf by the University of Connecticut's Office of Undergraduate Research. The Omeka Everywhere team thanks its many collaborators: Greg Colati, Graham Stinnett, Laura Smith, and Kristin Eshelman from UConn's Archives & Special Collections; Nancy Stula, Kerry Smith, Karen Sommer, and Rachel Zilinski from the William Benton Museum of Art; Alexis Boylan and Rick O'Toole from UConn's School of Fine Arts. Members of the RRCHNM team are Sharon Leon (co-primary investigator), Sheila Brennan (co-primary investigator), Megan Brett (project manager), and Patrick Murray-John (developer). Ideum team members are Jim Spadaccini (co-primary investigator), Jiani Chen, Nora Galler, Shaun Marsh, and Darold Ross; Curtis Bennett and Stacy Hasselbacher also worked on the project. Tom Scheinfeldt (co-primary investigator), Clarissa J. Ceglio (UConn co-primary investigator), faculty members Joel Salisbury and Mike Vertefeuille, and undergraduate researchers Andrew Wolf (Class of 2018) and Samantha Mairson (Class of 2017) constituted the UConn Digital Media & Design team. White paper design by River Soma.

Works Cited

Creed, Chris, Joseph Sivell, and John Sear. "Multi-touch tables for exploring heritage content in public spaces." In *Visual Heritage in the Digital Age*, eds. Eugene Ch'ng, Vincent Gaffney, and Henry Chapman. London: Springer: 2013.

Dumas, Joseph S., and Janice Redish. *A Practical Guide to Usability Testing*. Portland, OR: Intellect Books, 1999.

Hughes, Karen, and Gianna Moscardo. "Connecting with New Audiences: Exploring the Impact of Mobile Communication Devices on the Experiences of Young Adults in Museums." *Visitor Studies* 20, no. 1 (2017): 33-55.

Krug, Steve. *Don't Make Me Think!: A Common Sense Approach to Web Usability*. Berkeley: New Riders Pub., 2006.

Nielsen, Jakob. *Mobile Usability*. Berkeley: New Riders, 2012.

——. *Designing Web Usability*. Berkeley: New Riders, 2000.

Tallon, Loïc. "Introduction: Mobile, Digital and Personal." In D*igital Technologies and the Museum Experience: Handheld Guides and Other Media*, eds. Loïc Tallon and Kevin Walker. Lanham: AltaMira Press, 2008.

Usability.gov. http://www.usability.gov/.

Wyman, Bruce, Scott Smith, Daniel Meyers, and Michael Godfrey. "Digital Storytelling in Museums: Observations and Best Practices." *Curator: The Museum Journal* 54, no. 4 (October 1, 2011): 461–68.