
Improving access points for local history preservation by listening to users

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Abstract:

User experience (UX) research represents how design decisions affect the target audience of a given product, whether that product is as tangible as a writing desk or as intangible as pathways to a digital object. This paper examines results from a case study of user interactions with descriptive metadata of one photograph, as shown through eye-tracking, verbal, observational, and verbal data. This paper discusses the role user experience research can play in representing and preserving local history and cultural identity, and it concludes with pragmatic advice about how UX can inform metadata design in future projects.

Keywords: user-centered design, user experience, descriptive metadata, access points

1 LOCAL IDENTITY AND METADATA

In 2013, I designed a user experience (UX) study to examine metadata for photographs. The photographs I chose for the study had been contributed to The Portal to Texas History and represented three different special events hosted by three different local community groups. I determined to study photographs because, once they have been made digitally available and unless a subject matter expert originally had written information to accompany the physical object, photos cannot speak for themselves. Whereas textual objects are fairly self-explanatory, photographs require detailed description, but they provide important views into how people lived. The study gathered four types of data from participants, three of which I discuss here: eye-tracking, verbal feedback, empirical observational data. This paper will explore tasks pertaining to one specific photograph and its accompanying description, and it will discuss how the results of this work can inform local history identity preservation and metadata creation practices.

1.1 Research Design and Methodology

In designing tasks for users, I shaped them around complex systems theory, particularly as explored by Michael Albers (2011) in his article, “Usability and Information Relationships: Considering Content Relationships and Contextual Awareness When Testing Complex Information,” with the idea that, within a complex communication system, no single, cut-and-dry answer exists, and design and usability task design must shift from simply watching users locate information to “supporting *integrating* multiple information elements” (Albers, p. 111). I applied Albers’ recommendations to Angela Spinazze’s definitions of metadata from her 2004 article, “Museums and Metadata: A Shifting Paradigm,” because Spinazze well demonstrates how metadata description changes for physical objects that have been made available in the digital environment. The overarching test design was informed by Carol Barnum’s *Usability Testing Essentials: Ready, Set. . . Test!* (2011) and Dumas and Redish’s *A Practical Guide to Usability Testing* (1999). Finally, shaping all of these tasks was informed by MEELS, the primary acronym in usability, which stands for memorability, efficiency, errors, learnability, and satisfaction, and most definitions of usability incorporate variations on MEELS (Still, 2009).

For actual data gathering, I utilized an eye-tracking device called the EyeGuide Mobile Tracker, to observe qualitatively how users’ eyes moved over the text. I recorded tasks and interviews and coded events and errors with TechSmith’s Morae suite of software. I tested two sets of users: the first were eleven users who were experienced with The Portal to Texas History, who had worked with the site more than three times in the past year, and the second were ten users who had never before visited the website. I gave individual participants codenames, based on whether they were experienced or inexperienced, along with a number, for example U1-experienced, U3-inexperienced. This study was approved by the Institutional Review Board of University of North Texas.

1.2 Object, Tasks, and Questions

The most significant need demonstrated by this project is that local history as revealed in photographs should be preserved through accurate, contextually-based description so that researchers can understand how a given photograph represents and relates to its originating community. The entire test instantiation examined two individual photographs and one set of photographs, but results from studying the first image especially inform the significance of good local history representation for long-term usability and preservation. This photograph came from the Austin Theological Seminary, and it depicted a ground-breaking ceremony for the Texas-Mexican Presbytery (see Figure 1). The description for this image explains literally what appears in the photograph, and I wanted to know whether users could understand the people and the purpose behind why the photograph existed. In the larger study, I triangulated the data to arrive at the conclusions below that relate to local history.

[Photograph of Woman Digging]

Brief Record Full Record Statistics



Description:	Photograph of a women digging in the ground. She is wearing a gray skirt and jacket and is using a shovel. There is a small, low-lying, wooden enclosure around the area where she is digging . Behind the woman , automobiles and a bicycle are parked.
Creator(s):	Unknown
Location(s):	United States - Texas - Cameron County - San Benito
Creation Date:	Unknown
Partner(s):	Austin Presbyterian Theological Seminary About Browse this Partner
Collection(s):	Texas Cultures Online About Browse this Collection
Usage:	Total Uses: 90 Past 30 days: 6 Yesterday: 0

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Figure 1: Image and description for Tasks 1-3, from <http://texashistory.unt.edu/ark:/67531/metaph165600/?q=woman%20digging>

As I prepared tasks, I posed questions relating to what Albers (2011) identifies as “how people integrate information” (p. 111), stating, “A person who can quote facts and figures, but not connect them to the situation or make inferences, does not have contextual awareness. . . complex information provides the ability to take those facts and figures, build the relationships between them in a way that makes sense within the current situation, and then use that information to make inferences and decisions” (p. 114). I planned tasks that would provide the opportunity to observe chains of thought and to dissect how they perceived the situation, or the local community, documented within the photographs (see Table 1).

Table 1: Tasks users performed with "[Photograph of Woman Digging]"

Beginning a Search: What do users look for when they perform a search and receive a listing?

Task 1: Perform a search for **woman digging**. Look at what appears in the search results. Feel free to click on any of the search result items to learn more about them. When you feel like you have the most relevant information associated with this image search, please click the "End Task" button.

Connecting Object to Search Term: What do users observe and seek out when they think they have found an object that fulfills the search term?

Task 2: Please click on the image listed at the top of the search results that came up in the previous task. Look through the descriptive information, and feel free to click around other links on this page to learn more about this photograph. When you feel like you have the most relevant information associated with this photo, please click the "End Task" button.

Task 3: Bring up the subject.txt file from the bottom of the screen. Look at the subjects listed and place an X next to each subject that you think could describe the photograph you've just been looking at. When you have selected all subjects you feel are relevant to this picture, please click the "End Task" button.

- People–Individuals

- Social Life and Customs-Customs–Celebrations

- Architecture–Construction

- Religion-Denominations–Presbyterian

- Religion-Churches–Clergy

- Religion–Congregations—Texas--Mexican Presbytery

1.3 Post-Test Walkthrough and Questions

I gathered verbal data from users with two different questioning techniques. Active Intervention (AI) questions in UX research are questions consistent across all users to gain specific knowledge about UX as related to the initial testing goals (Redish, 1999, p. 32). Because this test employed eye-tracking, I asked participants to avoid speaking during initial task performance. I asked users to respond to these questions in a follow-up walkthrough of the areas initially tested (see Table 2). When users did something unexpected during task performance, additional follow-up questions helped me understand this unexpected action. These questions were Retrospective Recall (RR) questions, specific to individual user performance and posed after the test.

Table 2: Active Intervention (AI) and Retrospective Recall (RR) questions

Task	Question
Task 1, AI 1	Based on the thumbnail that appears at the top of the search results and the words that accompany that thumbnail, what did you first think was going on in this photograph?
Task 1, AI 2	What elements in the search result listing did, or did not, help you understand what is going on in this photograph?
Task 1, AI 3	What elements might you add or remove to help someone better understand what's going on in this thumbnail, on the search results page?
Task 2, AI 1	Go ahead and go into the image. Once you were able to see it bigger and look around the record, what did you think was going on in the picture?
Task 3, AI 1	Why did you pick the subjects you marked?

1.4 Eye-Tracking Data: Do Users Actually Read the Metadata?

I utilized eye-tracking data for this project to provide qualitative information about whether and where users were reading when they looked through the objects during task performance. In particular, I made use of heatmaps, which show colored area where the individual users read—and since this heatmap application was qualitative, I only looked at heatmaps that represented one user at a time. I also utilized gazeplots, which show a combination of fixations of .2 seconds and saccades, or the back-and-forth eye movement, on a numbered path according to the order in which they occurred.

An easy excuse for not worrying too much about how users work with description is to say that they do not read the description. The eye-tracking data from this instantiation provides direct insight into whether, how, and what users read of the description. Figures 2-3 exemplify fixations and saccades of one user, reading back and forth between the highly-detailed description and the photograph that it accompanies, but they are representative of all users tested, who read through the information.

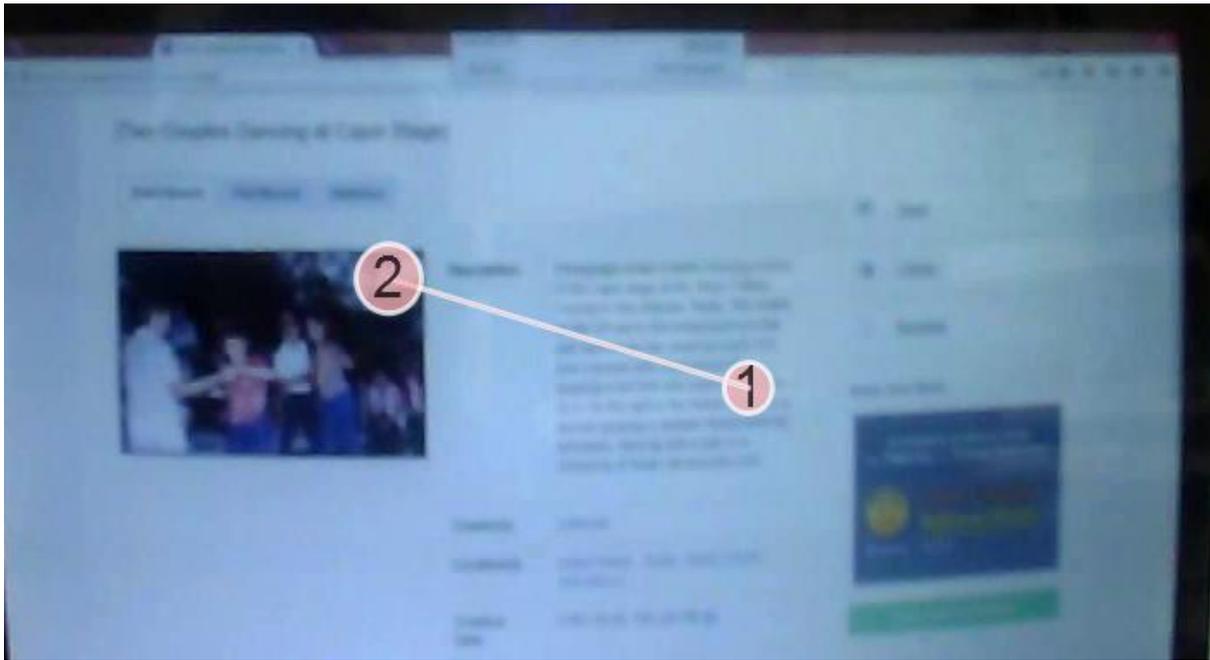


Figure 2: User gazeplot, between image and description.

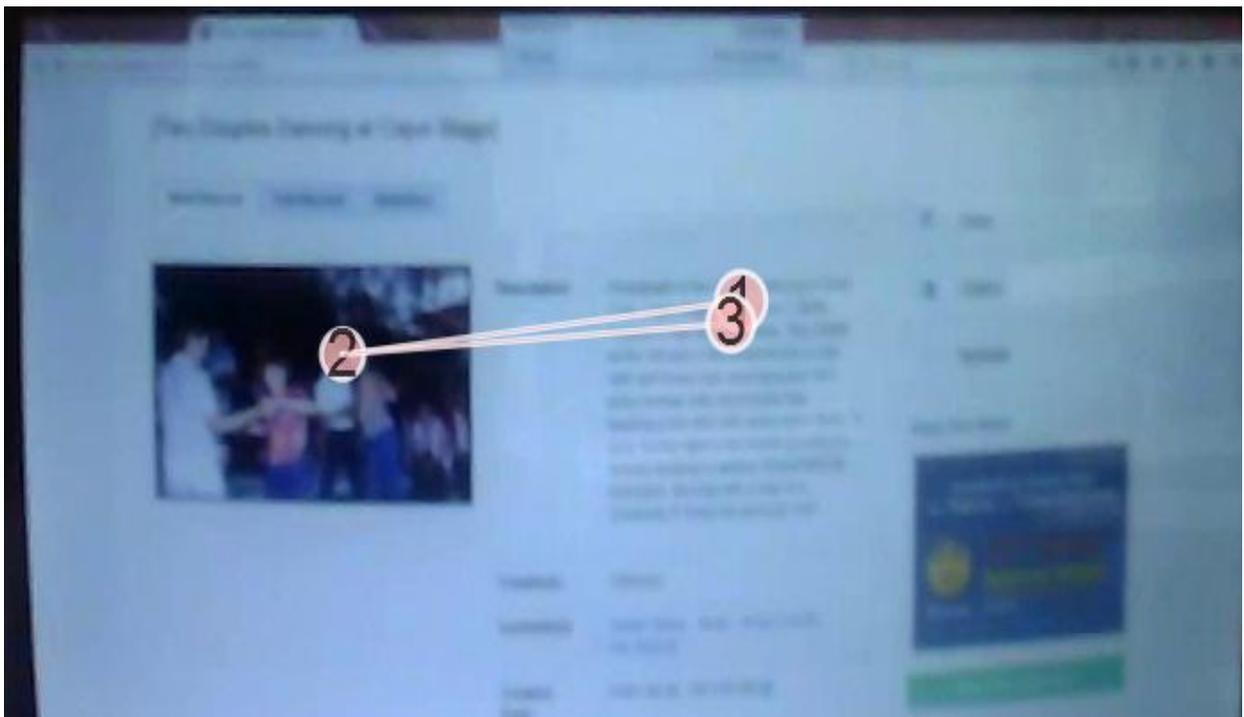


Figure 3: Continued gazeplot from same user in Figure 2.

2 RESULTS

2.1 Tasks 1-2

Task 1 focused on the search results listing and the text accompanying thumbnails appearing in the results display, and Task 2 centered on the target image, “[Photograph of Woman Digging]”. A search engine of some kind is the first source for local history research, and the description that accompanies thumbnails in a search display is where users will first determine whether

or not they want to dig deeper into their research. Thus, I was very interested in learning what users from both groups (experienced versus inexperienced) thought was happening in the results display, particularly in the target image, the woman digging photograph.

For both user groups, severe errors occurred during Tasks 1-3 that related to how users interpreted the descriptive record. In comparing the verbal responses and observational data from U5-inexperienced and u4-inexperienced (see Table 3), users' understanding of what is happening is very different. The main point these users illustrated is that individual fields of description support users in understanding the targeted thumbnail in relation to the query and to other search results in a display. U4-inexperienced asked specifically "what's the larger picture," apparently seeking to turn details into a wider comprehension that was otherwise missing, including information like geographic location. U5-experienced had worked with the Portal before, but still could not fill in the correct story of what was happening in the image.

Table 3: Comparison between two users' responses about conclusions they drew looking at the search results display.

u5-experienced	AI1: "That she was digging a garden."
u5-experienced	RR: "And what did you use to come to that conclusion?" A: "The word digging, and then I looked at the thing because she's digging in the ground. She didn't have a construction hat, so I'm assuming a garden."
u5-experienced	AI2: "Um. That's a tough one. I guess just reading 'digging in the ground' when I read it. The description."
u5-experienced	AI 3: "Maybe just say 'unknown woman.' And I guess I'd correct the spelling error. And maybe um, the automobiles to be identified. If someone needs a picture of a '57 Buick, it might be helpful to know what automobiles are." RR: "And unknown woman--how would that help?" A: "If I needed to know who that was, that would be it."
u4-inexperienced	AI1: "I think, it looks like a ground-breaking ceremony for some type of event. I know she's digging, but she's not dressed to be working in the yard."
u4-inexperienced	AI2: "Um, the description of the bicycle and the car in the back. It seemed like random information. You can just look at the picture and see there's a bicycle and yes, there's a car."
u4-inexperienced	AI3: "Maybe where it is, talking about the geographic location. And why is she digging. Is it a ground-breaking? What's the event she's digging for? What's the larger picture she's digging for?"

Further into the tasks, starting with Task 2, verbal responses to questions across both groups indicate a lack of satisfaction and a lack of understanding due to an inability to understand what is happening in the photographs (see Table 4).

Table 4: Task 2 response examples, showing user confusion

U1-experienced	“You know. My story is that there’s a ground-breaking going on, but I can’t see anything on this page that would indicate there’s a ground-breaking going on. I’m not sure why I think there is. But that would be the story I’d associate with the picture. However, I feel like I was influenced by other text that I read.”
U2-experienced	AI: “I have no idea. I don't know the purpose for which she's digging. There's a reference to the church, but I don't know, you know, the church could be a sponsor, she could be a representative of the church. It could be on church grounds. She could be digging a garden. It could be architecture. There's just no information.”
U3-experienced	AI: “Well, like I said earlier, she's not dressed in work clothes. She's, I'm not sure I'd go so far as to say Sunday best, but she's dressed professionally. Being a somewhat barren landscape, it's probably a ground-breaking of some sort. At first I thought it might be some sort of vegetable garden or community garden, but I don't think that's the case. . . .”
U4-inexperienced	AI: “A couple things. She may be working on the foundation because they're going to lay a foundation here. Or they're doing a garden of some type. A flower bed or garden.”
U5-inexperienced	AI: “Once I pulled this up, that's when I saw that it was at this church, that it wasn't just her messing around in her backyard.”
U6-inexperienced	AI 1: “Now, I think that she is breaking ground on something, whether it be a house, or a church, or something like that.”

As with the search results display feedback, comments from Table 4 revolved around filling in what is going on in the photograph. These users relied on non-essential details to guess at the actual meaning of the photograph: “what she’s wearing and stuff,” “digging in a compost, but she was wearing a dress. So I’m getting mixed messages,” “with something vague, is descriptive on the one hand, but vague at the same time,” and with U1-experienced for task 2, “my story is that.” These user statements grasp at the details in the description because the larger view is not available, the purpose for or context in which the image was taken.

U6-inexperienced correctly identified what was going on, and when asked about having seen other ground-breaking photographs, said, “I think I clicked on the location, and when I clicked on the location, I just clicked on the first photo, and it was a group of people at a ground-breaking ceremony, and it kind of helped me realize what was going on.” The eye-tracking heatmap for U6-inexperienced (see Figure 4) shows that this user glanced through other ground-breaking ceremony images from the search result listing (<http://texashistory.unt.edu/search/?q=woman+digging&start=10&t=fulltext>), though not long enough to create fixations for a gazeplot. If this user was able to look through similar images by browsing and glancing through links on the record, it stands to reason that metadata creators can do the same thing to create accurate, pertinent description that contextualizes the purpose of why this photo exists.

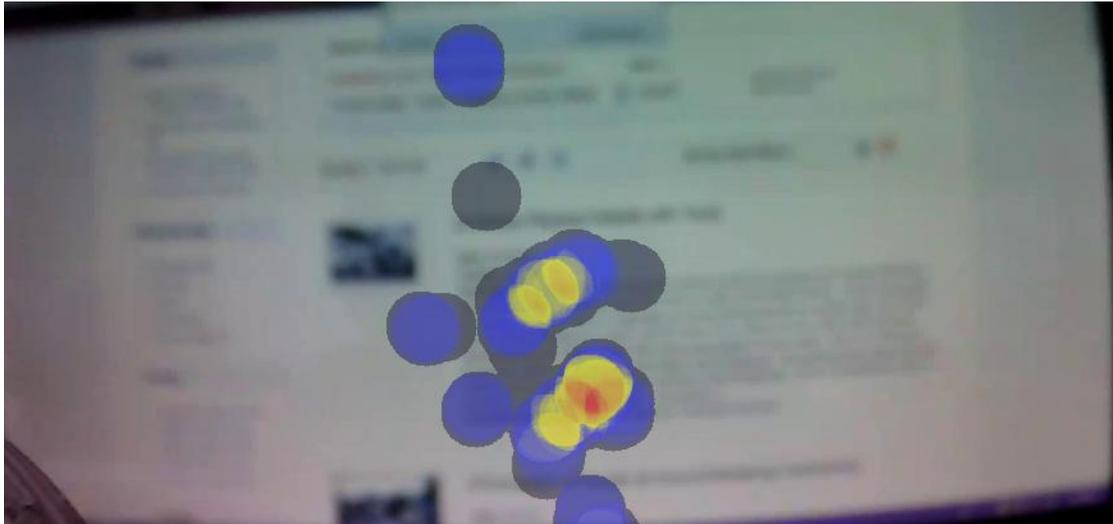


Figure 4: U6-inexperienced, eye-tracking heatmap, task 2.

To support better local identity representation, even if the full information doesn't exist about a single photograph, metadata creators utilize materials from collections to assign one sentence in every descriptive field to accompany each item across a collection, so that all items are better situated within their collection. This would better serve the target audience by contextualizing the purpose of the photographs, would decrease frustration and incorrect guesses, and would increase memorability and satisfaction, and facilitate learnability.

2.2 Task 3

Task 3 gathered the most data about how this description supports the group who digitized the photograph, the Austin Theological Seminary, as well as the group who originated the photograph, the Texas-Mexican Presbytery. This task asked users to consider a list of artificial subject terms, formatted as actual terms. The Portal to Texas History utilizes a combination of keywords and local structure, the UNTL-BS (Browse Structure) to identify coverage and subjects. The current metadata record for this photograph contains one subject term and three key words: “women, digging, Texas-Mexican Presbytery,” and these terms are all linked to related items on The Portal to Texas History. There is a problem, though, when the users can click on “women” or “digging” and reach completely different results than what this photograph seems to pertain to, and when they click on the “Texas-Mexican Presbytery” link and come up with 882 results (http://texashistory.unt.edu/search/?q=%22Texas-Mexican%20Presbytery%22&t=str_subject) that actually appear more relevant than the results that come up from the other two keywords.

User responses to the subject list varied, but many users expressed curiosity or inclusion of “Texas-Mexican Presbytery” in the list, while one experienced user made a statement of not knowing why s/he chose that subject term. A breakdown in communication to the collection's target audience is apparent through statements like that of U3-experienced, “And it just says Presbyterianism, and being in South Texas, there's likely to be Mexican-Hispanic influence, but I wouldn't want to mislead someone,” from U5-experienced, “I didn't say Mexican Presbyterian because just because it's in San Benito doesn't mean it's something Mexican,” and that of U2-inexperienced stated, “And Mexican Presbytery. I don't know where that came from, I can't even dare to make a presumption about that.” While the “Institution” field on the Portal record lists the Austin Presbyterian Theological Seminary—

who holds the physical objects--the items that connect through the keyword facet from the "Full Record" view all go to the Seminary-held, Texas-Mexican Presbytery photographs.

The user responses about the inclusion of the Texas-Mexican Presbytery in the subjects list raises a significant issue in terms of cultural identity representation in photographic description. U3-inexperienced, despite having read through the "Brief" and "Full" records (see Figures 5-6), incorrectly identified Austin as being where the photograph originated, during Task 2, and by Task 3 was still uncertain about what the photograph represented (see Table 5). This uncertainty indicates a lack of clarity in situating the image around the group who took the photograph, the location where the image was taken, and the institution who contributed the photograph to the Portal. This lack of clarity reveals itself as causing dissatisfaction amongst users.

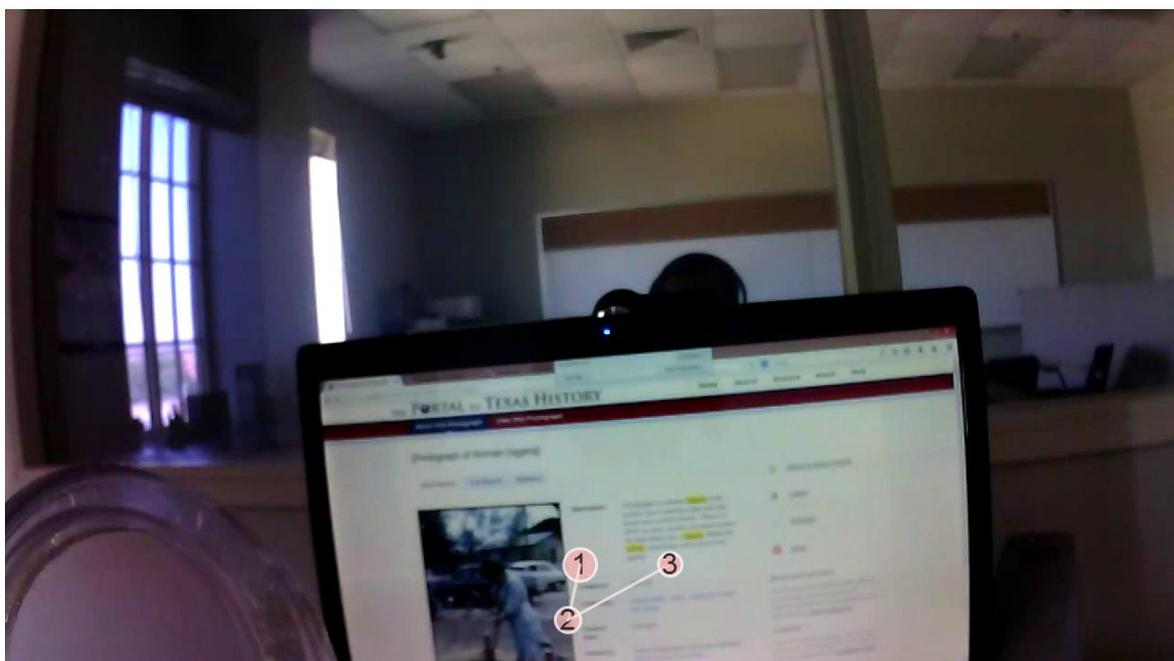


Figure 5: U3-inexperienced, gazeplot, Task 2

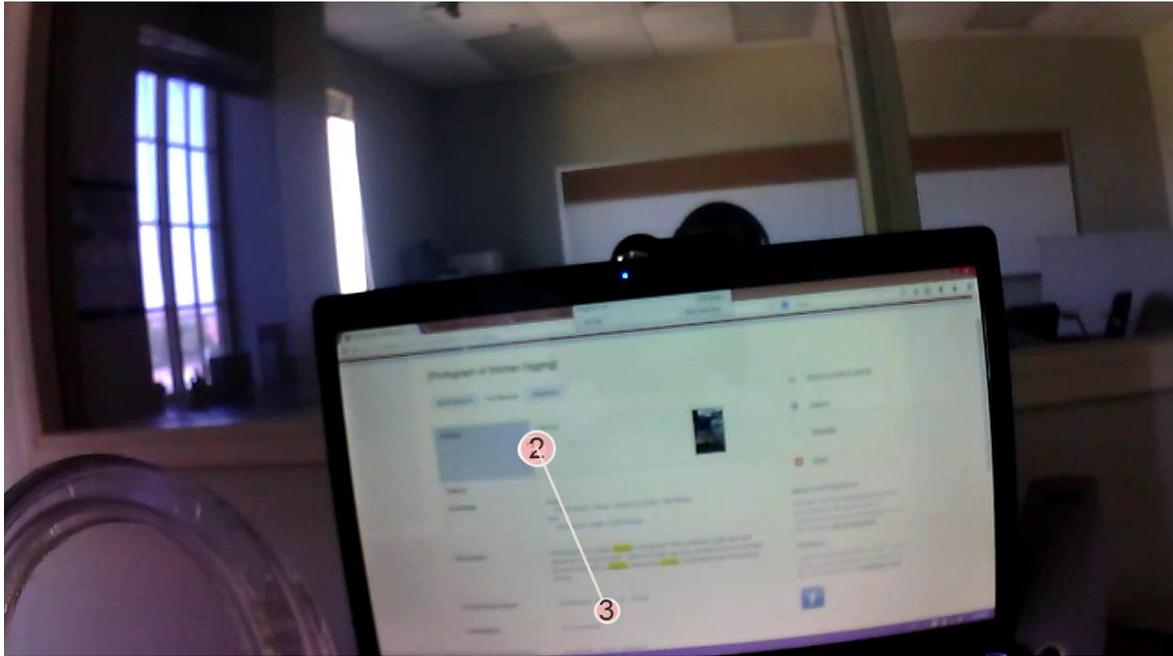


Figure 6: U3-inexperienced, gazeplot, Task 2

Table 5: U3-inexperienced, verbal responses to Task 1, AI3, and Task 3 AI

U3-inexperienced	Task 1, AI 3: “This photograph? Um, I guess maybe, uh, the precise location of where she is, or just a town, or uh, I assumed it was Texas. I see it says Austin, but I didn’t see that until I read through the description, actually. The description of the bicycle and the car in the back. . . . it seemed like random information. In the back is a bicycle, and there's a car.”
U3-inexperienced	“Construction-Like I mentioned, uh, it looks like she’s in the process of building or creating something. You know, whether it be putting another two boards up and making a box, or digging plumbing, something of that nature. . .”

Obviously, all the people who appear in an older photograph might not be identifiable. However, a great deal of local history information exists that can at least identify a photograph if it relates to the wider community history. Not including the reason as to why and for whom this photograph was taken creates additional accessibility problems for multiple audiences that can be fixed with thoughtful planning, both on the level of a metadata librarian who situates records within a larger digital collection and on the level of the local historian who has found the original photographs.

3 CONCLUSION

A usability problem exists when the test data reveals a communication gap between the group of people being represented by the photograph and the audience that sees that photograph. When errors occurred in Tasks 1-3, they were errors in understanding, such as that the photograph was taken in San Benito County, Texas, though the object comes from the Austin Presbyterian Seminary in Austin (Travis County), Texas. Some users could not perceive the relationship between the Texas-Mexican Presbytery and the photograph. Although the

message may have seemed clear to the metadata designer, this kind of confusion is something that required UX to demonstrate. The eye-tracking data indicates that users read most of the information, and even in the case of the inexperienced users, that they were able to glean enough data to make educated guesses. But guessing should not have to happen. David Weinberger (2007) explains the difference between context, assumptions, and meaning, with the argument that in arranging digital information, we are building “an infrastructure of meaning” (p. 171). In terms of metadata for individual objects within digital collections, this infrastructure of meaning should expand from the item out to its wider collection, out to the scope of the larger repository, which in this case is The Portal to Texas History, and out to the Web to be located by users interested in cultural experiences of the Texas-Mexican Presbyterian organization.

The Portal to Texas History encompasses objects from many different cultures, including objects from a South Texas Presbyterian community. I would recommend that metadata trainers teach designers to explore other sources of biographical information when objects seem difficult to describe. One example is “TARO,” the Texas Archival Resources Online is an index of archival holdings across Texas, containing biographical information of archival institutions, along with metadata about the physical location and features of individual objects. TARO is openly accessible and heavily indexed in Google for text searching. The Texas-Mexican Presbytery, according to the Austin Presbyterian Theological Seminary’s “Administrative History” entry in TARO, was

“. . . established by the Synod of Texas of the Presbyterian Church, U.S. in 1908, based on the missionary work of Walter S. Scott and Robert D. Campbell. These men organized and aided in the development of Mexican Presbyterian churches and religious education programs in Texas, particularly in the southwest region. . . . The Presbytery also established a Spanish speaking department at the Austin Presbyterian Theological Seminary. . .” (TARO, 2013).

The Texas-Mexican Presbytery represents a unique page in Texas history, as do many of the materials on The Portal to Texas History. To best serve these objects and cultures, metadata designers should utilize information that already exists to enrich the description and to better serve Portal audiences.

3.1 New Practices for Metadata Design Training

This initial project has produced results that demonstrate a direction for design considerations in terms of contextualizing photographic description according to why the photograph exists, rather than focusing on excessive detail that does not enhance meaning but rather serves as meaningless noise. An emphasis on contextualization in metadata would better serve the local identity of the community groups who originated the given photographs. While individual metadata records can be fixed and edited, the reality is that we need new training methods for metadata designers, which include librarians, student assistants, and primary source content contributors (in the case of the Portal, called “Partners”), and these methods need to focus on context, on centering the individual photograph within its wider collection.

Enough users stumbled on other photographs of the ground-breaking celebration, within the same collection, that they were able to make educated guesses about what the photograph meant. With good contextualization within the description, users would not need to stumble around to understand what they are looking at. Training metadata creators should involve defining the rhetorical concepts of *ethos*, *pathos*, and *logos* within objects, and combining

that with an understanding of how an individual item situates within its wider collection to represent the audiences who own the physical object. If training is done properly, new metadata creators, whether they are volunteers, student assistants, librarians, would be able to consider how rhetorical concepts affect UX.

3.2 Recommendations

In my own work managing the Digital Newspaper Unit out of University of North Texas Libraries, I regularly speak to local museums, historical societies, and libraries in communities with very low and shrinking populations. This is partly due to the fact that the private foundation who provides a tremendous amount of support for us to digitize community newspapers in Texas funds projects for populations below 12,000. This is, however, also due to movement from rural to larger urban complexes, and as a result the communities recognize the need, almost feel a pressure, to preserve their local history materials. When objects are loaded into the Portal, UNT Libraries commits to access and preservation of the objects in perpetuity. The local history as revealed through these objects is accessible to the world. Metadata description serves to entrench long-term access to local history. In conclusion, I propose the following recommendations for collection and item description, drawn from this study:

- 1) **Detail the relevant details:** Consider why the photograph was actually taken--Did someone snap a photograph to represent the woman at the ground-breaking event, or to represent the bicycle that appears in the background that are accidental to the image? As this study indicated, users can get bogged down in too much detail, to the point where meaning is lost about the actual historic event depicted.
- 2) **Use the research resources at your fingertips:** Photographs often appear in archives or special collections and will eventually get digitized, but those archives frequently have enough contextual information that the photographs do not have to appear as orphaned images with no tie-in to actual historic events. Usually the minimal level of contextual information provided to archives can lead to further and richer information through a basic web search.
- 3) **The photograph serves as a document, but so does its description:** Even if you're a metadata designer who has no clue about the individuals pictured in a 1920 photograph of farmers digging in a field, if you are able to find some information to explain why the photograph exists, you can offer accurate documentary evidence about what the photograph was intended to represent. Event photographs, unlike artistic photographs taken for aesthetic reasons, serve to show how people lived, to explain activities people performed, and the description should parallel these purposes as closely as possible.
- 4) **Be aware of audiences:** Multiple groups comprise the audience for a digital primary source image, including those groups who contributed the item to a collection, those groups who research the collection, and the general public. Audience needs can and should shape how the description supports the photograph, and this can be gauged through UX research.
- 5) **Ask anyone who is not a metadata designer:** User-centered design happens when design is based on how users interact with a given product, and anyone can offer helpful insight into improvement that product, whether it is an alarm clock or descriptive metadata. The whole point of understanding the effectiveness of a record is to frame the design around how real people use it.

UX work with this single object informed what users look for in their descriptive records, but it also demonstrated how individual description can affect the wider system and beyond, particularly in consideration of metadata aggregation through such groups as the Digital Public Library of America (<http://dp.la>). Descriptive metadata tells the story of digital objects that cannot necessarily speak for themselves, and the descriptive metadata feeds directly into a larger collection body that should support accurate identity representation of the communities who originally hosted the events and created the photographs for the communities of users who will learn from those same photographs in generations to come.

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