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A contributory archive is one in which individual users may interact with materials through activities like commenting, tagging and sharing, but more importantly they may add content to the collection through uploading items like photos or videos and adding stories and text. This paper examines the community-led contributory archives listed at the website for the UK Community Archives and Heritage Group (www.communityarchives.org.uk), an umbrella organization that provides a central location for community archives, as a case study for expanding our knowledge of user participation in digital archives. This study examines user-generated content in digital community archives including annotations and contributions, the type and frequency of content created, and technical specifications as insight into amateur digital preservation of heritage materials. The information gleaned from this study can be used to assess the effectiveness of community-led projects as a possibility for cultural heritage centers to expand their mission in a participatory platform.

Headings:

      Cooperative acquisition of archival materials

      Digitization of archival materials

      History -- Sources

      Web archives

WE SHARE WHAT WE ARE:
USER CONTRIBUTIONS AND ANNOTATIONS
IN DIGITAL CONTRIBUTORY ARCHIVES

by
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Introduction

The internet has for some time been evolving and becoming highly dynamic, integrating social and interactive standards for most things on the web. Many library and archival institutions have been implementing social media accounts and other connective technologies to raise awareness of their digital collections for years. For example, the Library of Congress has a Pinterest profile, a Facebook page, a Twitter account, a YouTube channel and a Flickr page. The National Archives has all of those, plus a wiki page, a blog, and individual Facebook pages for each branch to give their online content a more local context for their viewers. When it comes to state archives, each individual state is still not yet fully on board with social media. More than half implement little or no social media tools (see Appendix 1). The North Carolina State Archives is among the few that use social media in a significant way, including Facebook, Twitter, YouTube, Flickr and a blog. At an even more local level, individual North Carolina county historical societies have the least social media presence of these samples, often only a Facebook page if anything at all, including a simple website (see Appendix 2). As interaction and connectedness is so abundant and common in most other areas of the web, those who have not embraced the dynamic changes might have difficulties integrating into the virtual community as it continues to evolve.

Most of the social media tools that National or State Archives deploy allow users to comment on items or posts, tag or identify photos, or share items on their own social media outlets. However, not many allow individuals to add their own documents or items

of personal significance, which is hardly surprising. First, there is the possibility for inappropriate content to be added to the collection. In addition, user contributions would likely result in an overwhelming amount of material, and organizations like these are too large to accommodate specific communities in such high detail. In looking at the current state of web presence for memory institutions that might better serve the interests of those who want to contribute within specific communities, historical societies fare the worst. Though largely underrepresented in digital space, they have a long tradition of preserving local cultural heritage items, often reaching the public through local history museums, publications, or events. Most local cultural heritage organizations lack the resources to implement any large-scale web initiatives, mainly because of a lack of funds, hours, and technical expertise. Nationwide, there have been quite a few coalitions between graduate students and historical societies to build interactive websites. One such example is the study from the Graduate School of Library and Information Science at Simmons College in Boston implementing cultural heritage informatics, or the partnership of computer science and cultural heritage, across six small institutions containing archives through the use of Omeka (Bastian 2012). However, certainly not all organizations have the opportunity to use such resources. Aside from joining social media sites, a possibility for these heritage centers to keep up in the digital era is the creation of contributory community archives.

Much of the literature on community archives emphasizes that they are established to represent underserved populations comprised of individuals who share a common aspect of their identity, be it ethnicity, sexuality, locality, or hobbies and interests. Community archives like these are in general gaining popularity worldwide,

with new digital space for specialized topics popping up everywhere. As noted in a recent case study of the Lavender Library, Archives, and Cultural Exchange of Sacramento, "literature continues to grow on community archives' histories and practices, [but] numerous gaps still exist. As community archives is a relatively recent field of study, with much of the research being done outside of the United States, many archives have yet to be documented" (Wakimoto 2013, p.444).

There are existing community archives that go beyond simple social media integration and allow individual users to not only contribute, but to also create and maintain the archive as a whole. These types of community archives are typically an historical representation of a particular community or cultural heritage mission, but archives of the fullest contributory extent mainly exist outside of the United States. The UK Community Archives and Heritage Group (http://www.communityarchives.org) is an organization that provides a central location for individual community archives. It acts as both a directory of websites for cultural heritage centers and as a guiding hand in the creation of community archives, offering software, recommendations and best practices for building digital archives. Currently host to a listing of over 500 cultural heritage sites and community archives, including 21 openly contributory websites, this organization invites anyone to join in order to contribute or to add their own archives to the central listings. These sites under the Community Archives and Heritage Group umbrella are run by individuals or heritage centers and encourage community members to interact by telling their stories, commenting, and in some cases, uploading their own photos or other digital items to a themed collection, such as Irish Heritage, Sussex Deaf History, or specific district histories.

In his studies into community archives, Andrew Flinn, who has strong ties with the UK Community Archives, refers to them as "the grassroots activities of documenting, recording and exploring community heritage in which community participation, control and ownership of the project is essential" (Flinn 2007, p.153). This type of cultural heritage repository cannot be built by an archive alone, but requires the curiosity and commitment of those within or with ties to the specified community. In 2010, Flinn gave a lecture at an Archives 2.0 conference, outlining the research needs in the field of contributory community archives, saying:

> Over the next few years we will need to explore how best to support and encourage communities to contribute to such initiatives, to find out what works and what does not, to explore how the reliability of the entries is to be gauged, to examine the continued role for professional mediation, and what is the relationship to the professional catalogue. Nothing is fixed here, but we should be careful neither to exaggerate the potential of these developments nor to close down or ignore the opportunity that they offer.

In short, we must investigate the possibility of a new archival frontier: one where everyday users are expanded from the constraints of physical and traditional archives to include the curious but novice historian, the owner of personal collections, or the avid memorialist and storyteller, as well as one where individual knowledge shapes both the archive and the history being formed. However, before considering this as a future for the profession, we as a field must first evaluate the effectiveness of such initiatives within the measurable and defined terms of the field, specifically in terms of context, description and digital preservation. By examining user-generated content in digital community archives, including annotations and contributions, the type and frequency of content created, and technical specifications as insight into amateur digital preservation of heritage materials, some of these questions of effectiveness can be explored.

Literature review

Canadian archival theorist Terry Cook argued that the role of archives has changed drastically over the past 150 years. In Cook's view, in the landscape of a changing society and improving technology, an archive's function has evolved "from juridical legacy to cultural memory to societal engagement to community archiving," changing the role of the archivist on a wide scale beginning with "passive curator" and continuing into the future to the "community facilitator" (Cook 2012, p.116). In this changing climate, Cook argued that archivists have the "exciting prospect of being able to document human and societal experience with a richness and relevance never before attainable, and with it the opportunity to blend our past foci on evidence, memory, and identity into a more holistic and vibrant 'total archive'" (Cook, p.113). As the role of some branches of historians has changed to investigate the significance of the silenced or under-acknowledged in development of society, it is not implausible for the role of archivists to change to incorporate those voices into both the current history and the historical record (Cook; Trouillot 1995). Additionally, the internet itself creates a platform for individuals to more directly and conveniently impose their mark on history. As Ekaterina Haskins explains, "the internet levels the traditional hierarchy of author-text-audience, thereby distributing authorial agency among various institutions and individuals involved in the production of content and preventing any one agent from imposing narrative and ideological closure upon the data" (Haskins 2007, pg. 406). Paired with the openness of the internet and individual users, community archive projects

are poised to create those "total archives" that Cook describes.

Linked to Cook's vision of "total archives" is the concept of documentation strategy, or a way of connecting archives with all of the users and stakeholders of the materials to actively guide the collection process and ensure a topic is covered without gaps in knowledge or records. Over the past few decades since documentation strategy has been defined and discussed as a concept worth exploring, there has been much debate in its effectiveness, particularly for smaller archives without the resources necessary to support the new function of pairing with other institutions. In his 1995 presentation, Terry Abraham touched on a link between documentation strategy and community archives endeavors, providing the example of Duke University's project titled "Behind the Veil: African American Life in the Jim Crow South." Spearheaded by the history department, this project involved the collection of oral histories from the aging African American population, based on the assumption that after the last of this particular generation passed away, there would be no sources of information for the individual African American experience during the Jim Crow era. Though Abraham was skeptical of the actual involvement from archives in the project itself, he did not deny that this project produced both materials and collecting avenues that would ultimately benefit archives. He explained in his presentation, "When I say that this is not an archival project, I mean that archival principles and concerns are not central to the project. The fact that it will produce or identify documentary material is a side-effect. The project's goals include books, exhibits, college courses, and a documentary film, not archival materials." Many contributory archives have the same goal of creating an exhibit and an outlet for expressing collective cultural memory, however, they are not embarking on an

archival mission. Their importance to archives is, like the oral histories of Duke's collection, an unavoidable side effect of their efforts.

Terry Eastwood expressed similar thoughts on this type of collection development. He explained some of the problems of archivists actively filling gaps in their historical records, saying, "the view of archivists as engineers of the documentary record of the past does indeed make their knowledge a combination of that of the historian with that of the librarian, for it involves some assessment of historical information and its organization to facilitate research. [...] They undermine alike a proper conception of archives and the development of the profession" (Eastwood 1993, p.251). Both Eastwood and Abraham, however, focused their opinions based on the act of record creation rather than the archivist's role in supporting, assisting, and linking with these other organizations in order to preserve those records. Since Abraham's and Eastwood's cautionary words in the mid-1990s, more and more archives have become involved in partnering with other memory institutions, and there are many published case studies for community archives that are built in this manner.

Contributions & case studies

Because community archives take a "ground-up" approach to documenting history through specific smaller communities within the whole, cultural heritage organizations are a likely candidate for founding or hosting this type of archival activity. In an environmental scan of cultural heritage institutions employing social media in New Zealand, Chern Li Liew found that most "take the form of blogs, Twitter feeds and Facebook pages that are primarily aimed at promotional activities rather than fostering user-contributed contents and a sense of online community" (Liew 2014). While most

cultural heritage institutions are still using social media for less sophisticated forms of

participation, Liew was able to find two specific cases of higher participatory cultural

heritage sites. In the most successful community project found, for the district of Kete

Horowhenua, individual users created 2183 topics containing 27714 images, 106 audio

files, 92 video files, 244 links, 2676 documents, and 368 contributions to the discussion

thread over the six years between 2007 and 2013. Though it is the most successful in

terms of eliciting participation and contribution of items to the collection from the

intended community, Liew still warns that "the lack of 'polish' or 'professionalism' in the

writing might make the site unappealing as a resource for serious historical researchers,"

and "the very small size of the image files used (often, of relatively poor quality) might

also render them generally unsuitable for downloading and re-use" (Liew 2014).

   While amateur digitization arose as a problem in the contributions observed by

Liew, Melissa Terras found quite the opposite when personal interest and devotion to a

topic is at its peak. In her tour of virtual amateur museums, she found that the niche

content had a very specific scope that was often unaddressed anywhere else, and that

ephemera was being documented, preserved, stored and catalogued in a fairly

professional manner by enthusiasts. Furthermore, these "pro-ams," or professional

amateurs, were in closer touch with their online communities and better served their

specific topics than any memory institution (Terras 2010, p.12). While her research was

into individual-created museums and not contributory archives, it is helpful to look at

these aspects of amateur digitization and curation as a serious leisure activity. Though her

findings did not specify the size or quality of files in the level of detail that Liew

reported, she may simply be pointing to the fact that their existence at all is better than

their absence.

In a case study of launching a community archive project, Janice Affleck, et. al., looked at the six-week Memory Capsule project for the Hong Kong Fringe Club. They used mass emails to invite members of the club to participate in a community cultural heritage project, offering a place to share stories, pictures, memories, and general discussions about their Hong Kong heritage. In order to achieve higher levels of participation, the email instructions were intentionally left ambiguous, so that individual participants could interpret the project themselves and offer materials as they thought fit. They found that over six weeks, the most comments that any particular item received by general users was only 10, or 37 (described as "naive chatter") by a school group. For items being added to the collection by individual users, they found that a total of 55 of the 118 contributions received required more information or extensive editing of content before having sufficient information to be put on the site. From the interaction they witnessed, they found that "participants in a virtual community can develop and communicate a sense of place from sharing their experiences of space, time, and social interaction," however they also questioned the efficacy of such projects on a larger scale (Affleck 2008, p.278).

In interviews with stakeholders in Scotland's Hebridean Connections project, a cultural heritage and history project allowing diasporic users to upload photographs and other records, the experience on the whole was reported in positive terms, but "there were concerns raised that allowing direct authoring by users may cause quality control problems [and] instead, it was proposed that social media tools could be utilised to encourage discussion and community building between users but would allow the central

database to remain protected and only the core project team would be able to validate records" (Tait 2013, p.575). Similarly, Sally Ellis, a tentative proponent of the use of crowdsourcing and user involvement in the creation of archives, expresses the underlying concerns over power and tradition held by many in the archival profession: "Inviting the public, both educated specialists and unvetted users, to create metadata, content, to transcribe historical documents or, in any way substitute their own expertise for that of the information professional, may be viewed as threatening to the experts' paradigm and certainly, at the very least, his livelihood" (Ellis 2014, pg. 5) These ideas express the concerns of archivists, historians and other academics involved with these types of projects, but other studies place more of an emphasis on the users than the organizers.

The Archives and Special Collections at Colorado State University-Pueblo and the University of Colorado-Denver saw that Hispanic cultural heritage in the region was at a high risk of being lost because no one institution devoted their resources to preserving it and community archives were formed to fill this gap. Pairing community centers with students, they built a space for photographs, stories, and oral histories. They ultimately found that appraisal, arrangement, and description can be "rearticulated as participatory, community-oriented processes," and that "libraries, museums, and other cultural memory organizations must seek ways forward that engage and feature, rather than dismiss or append, cultural and local meaning" (Allen 2012, p.50). Similarly, Duff and Harris state that "the power to describe is the power to make and remake records and to determine how they will be used and remade in the future. Each story we tell about our records, each description we compile, changes the meaning of records and recreates them" (Duff and Harris 2002, p. 272). Furthermore, empowering communities with their

own history-telling creates exactly the "total archive" that Cook described and gives archivists the necessary context to document voices of the marginalized and enriches cultural memory and identity (Shilton and Srinivasan 2007).

User studies have shown some difficulties in eliciting participation with existing items, but on the whole, researchers are hopeful that participatory archives create a positive environment for their users without severe negative side effects for archivists. In 2007, Krause and Yakel studied the users of a WWII historical collection, The Polar Bear Expedition. According to their findings, the process of creating a user profile and commenting on items in the collection introduced voices of users into the finding aids without compromising its quality. Moreover, while users did offer suggestions or corrections, their original fears of an overwhelming amount of these types of contributions were unfounded and archivists at the hosting library were easily able to accommodate this activity (Krause & Yakel 2007, p. 310). As Krause and Yakel demonstrated, the interaction between archivists and general users may not need to be in a checksum capacity. Those general users may contribute a depth to description that is otherwise unattainable.

In her study comparing the metadata created by user-generated tags to keywords assigned by librarians in Flickr and dLib.si, Marija Petek found a great variety in tagging: "The number of assigned tags differs greatly among participants, librarians and Flickr visitors; participants are heavy taggers while librarians assign only a few keywords" (Petek 2012, p.109). The high number for participants may in part be due to folksonomy, with individual users creating multiple tag names to convey the same meaning, but can also be attributed to individual interests and expectations of deeper levels of meaning to

each individual. The number of different tags aside, Petek found that the matching of tags between the two types of contributors, general users and librarians, is better than expected. However, the author admitted that the study felt narrow, and Petek strongly concluded those results are only suggestive and more research is needed.

Keeping contributory digital community archives in mind specifically, many questions can be explored and applied toward future research in the area of community archives. What types of contributions do individuals make in a cultural heritage environment, and do specific types of contributions provoke more annotations than others? In looking at specific content, how does the quality of contributions by individuals compare to the traditional archival guidelines for cultural heritage items, such as the quality of scans? How does participation in contributory archives change over time? For example, do older and more established community archives invoke greater participation, or is participation more closely linked to the time of publication? This type of archive building and history creation has the potential to simultaneously give a voice to the historically underrepresented and relieve some of the burden of archivists in creating the collection, and the answers to these questions could offer some insight toward delivering struggling cultural heritage missions into the new digital world.

Methodology

The purpose of this study is to look at aspects of user-generated content in digital community archives displaying cultural heritage materials. As established, a contributory archive is one in which individual users may not only interact with materials through comments, tagging and sharing, but also add content to the collection through uploading items like photos or videos and adding stories and text. These contributory digital archives exist on a continuum of professional involvement, from the community-led archives with no professional archivists monitoring contributions and annotations, to the institution-led archives, where archivists, historians and other professionals or specialists guide the process in great detail. This study looks specifically at the types of annotations and the types and quality of contributions within community-led archive projects displaying items of a community history. Because this study looks at whole collections, the individual user is defined as anyone who makes contributions or annotations of any sort without the need to differentiate the profession of those individuals. An annotation is any addition of any kind that an individual user made to existing items, pages or records in the archive. A contribution is the creation of a new record by individual users adding new materials to the collection.

Unlike any resources in the United States, the UK Community Archives and Heritage Group website offers a somewhat comprehensive list of digital community archives. While it is difficult to determine if the listings are exhaustive, the associated 21 contributory archives likely represent the majority of this type of project in the UK

because of the organization's wide reach throughout the cultural heritage community and

its role as a guide and host for this type of activity. Because of their nature as being

community-led contributory digital archives, these 21 archives are ideal sources of

information regarding user-generated content (See Appendix 5).

For each archive, the number of different categories on the site map are counted.

Examples of these categories include titles such as "Places," "People," "Topics," or

"Sports." After assigning each category a number, a random number generator selects a

collection. If there are sub-level collections within the category, the process is repeated

until reaching the individual page-level. Annotations are counted on the page-level and

another random number selects the specific contribution on the page. The random

selection process is repeated until 20 pages from each of the 21 archives have been

examined. Because the number of items in any collection varies greatly and some

collections may have as few as one item, there is no way to set a minimum number of

pages to view in each collection, but instead, data collection addresses the archive as a

whole. If any items are repeated in the random selection, they are omitted from the total

for that archive. This may result in fewer than 20 items for some of the archives, but

accounts for the smaller size of the archive without inflating their data.

Because this study focuses on all aspects of participation in a contributory

archive, annotations and contributions must be analyzed separately. Each item is

analyzed for both user annotation (see Appendix 3) and content of the contribution (see

Appendix 4) to calculate the number of each type of instance and to draw comparisons

and relationships between them. If the content of the annotation or contribution falls in

more than one category in the codebook, it is recorded as every applicable category. For

annotations, the date of page publication is recorded, as well as the date of comments to determine the length of time elapsed between each activity. Additionally, for contributions, the time of creation (historical or modern) is recorded as well as the file format and size, and the resolution for each image contribution. These technical aspects are compared against the Technical Guidelines for Digitizing Cultural Heritage Materials (FADGI 2010).

Knowing the most common types of contributions and annotations, and examining the relationship between the two, can help us understand what forms user participation takes, as well as what types of materials elicit the most response. Investigating the quality of user contributions might identify problems with a user-centric archive model, particularly if the items are of such a poor quality that they might not be suitable for use outside of the community archive environment. The information gleaned from this study about quality, content and participation in contributory digital archives can be helpful in assessing the overall effectiveness of community-led projects as a possibility for cultural heritage centers to expand their mission in a participatory platform, inviting community created archives with minimal amounts of guidance, approval or editing from staff members.

Results

Data was collected from the 21 contributory archives listed at the UK Community Archives and Heritage Group's main site (Appendix 5). After omitting repeated materials, incomplete or content-free pages, and pages with the comment feature disabled from the random selection process, the data collection resulted in 372 pages viewed containing 539 annotations coded by category (Table 1) and 395 contributions reviewed for their content (Table 3) and their technical aspects (Table 7). Annotations and contributions have separate, but interrelated, data.

Annotations

The number of comments on any particular page viewed varied greatly. 130 out of the 372 total pages had comments of any number greater than zero. 47 pages had only one comment, 49 of the pages had between two and four comments, 34 had more than five comments, and the majority, 242 pages, had zero comments (Chart A). The highest number of comments on any given page was 34, which occurred twice. Both contained discussions relevant to the page materials, as one was a historical discussion of a murder that took place and the other contained genealogical discussion of a particular surname.

Chart A: Annotations by Page

9%

13%

13%

65%

- Pages with 0 comments
- Pages with 1 comment
- Pages with 2-4 comments
- Pages with more than 5 comments
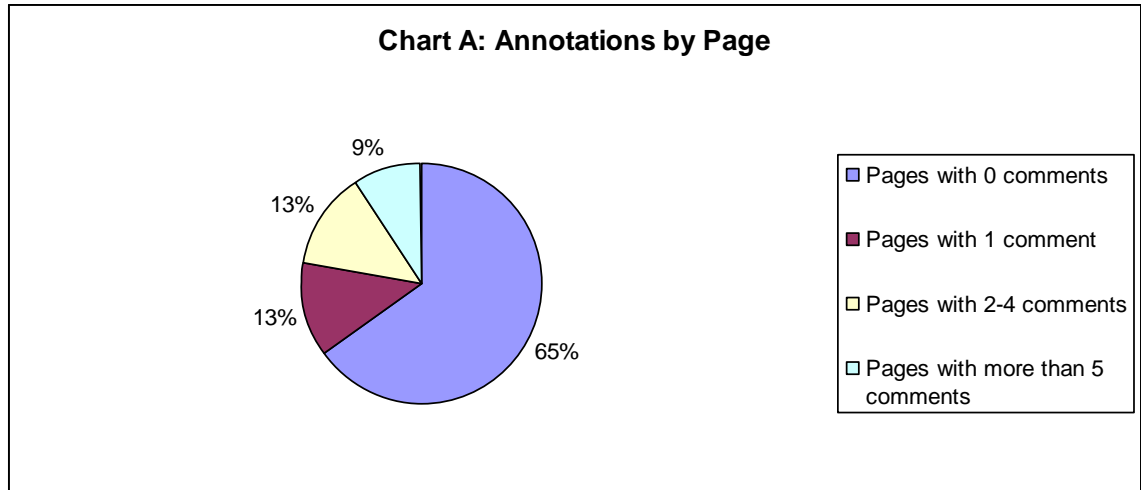
The comments themselves fell within a wide variety of categories, although some of the potential categories of coding were removed from the initial codebook because they contained zero within the sample (including the categories "translation" and "tag"). 84.4% of the comments fell in more than one category, such as offering a personal connection and a link to further resources. The number of comments in each category are presented in Table 1 (for a full description of each category, see the codebook in Appendix 3).

Table 1: Annotations, coded data summary

Annotations by Type	
identification	51
correction	17
further information	73
link to resources	29
answer	110
comment	62
personal connection	305
question	86
copy request	10
no activity	242

Personal connections, questions and answers, and further information make up the majority of the comments across all pages. At a basic level, this reveals that individuals

connect with the materials as well as with each other, which supports the overall mission of these contributory archives: to collect and preserve individual memory and foster community participation and discussion.

To address any affect of the amount of time the material had been available on the internet on overall participation, the length of time between publication and first comment was recorded, as well as the length of time between multiple comments on the same item (Table 2).

Table 2: Annotations, dated data summary

Days between publication and comment		Days between comments (if multiple)	
Mean	671.88	Mean	124.56
Median	446	Median	27
Mode	1	Mode	0
Max	3156	Max	1739
Standard Deviation	712.71	Standard Deviation	229.54

Most commonly, the first comment appears on the page within 1 day of the page's publication (28 times). Pages do tend to taper in the likelihood of participation over time, as most frequently the first comments appear within the first 10 days after publication. However, this decline is not dramatic, as pages may also have been published for years before receiving a single comment (Chart B). 57.6% of all of the first comments on any page appeared after a year since the original publication, and 36.8% appeared after two years.

Chart B: Frequency of comments since publication date

[Bar chart — Y-axis: Frequency (0 to 100). X-axis: Number of days with categories: 10, 120, 240, 480, 960, 800, 960, 1120, 1280, 1600, 1760, 2080, 2240, 2400, More. Bars descend from approximately 94 at 10 days down to about 3 at More.]
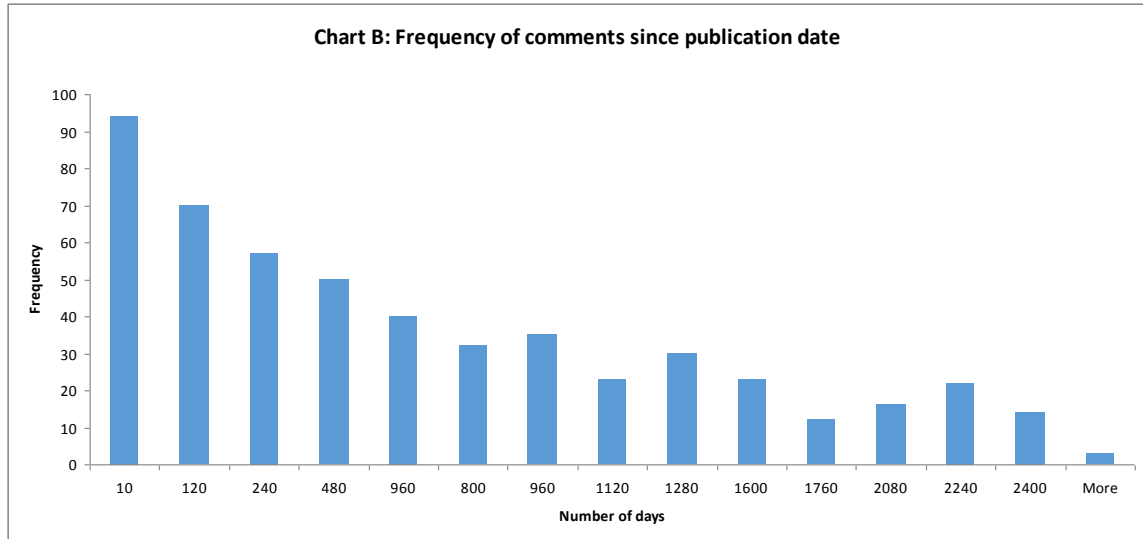
Similarly, comments appear after the first most often within 10 days, and many of the subsequent comments appear on the same day as the previous comment (Chart C). While additional comments may also appear years apart, typically comments appear sooner in relation to each other than when looking at the first comment alone.

Chart C: Frequency between comments

[Bar chart — Y-axis: Frequency (0 to 100). X-axis: Number of days with categories: 0, 10, 60, 120, 160, 240, 320, 480, 640, 800, 960, More. Bars: approximately 68 at 0, 90 at 10, 85 at 60, 38 at 120, 24 at 160, 24 at 240, 21 at 320, 23 at 480, 7 at 640, 6 at 800, 4 at 960, 6 at More.]
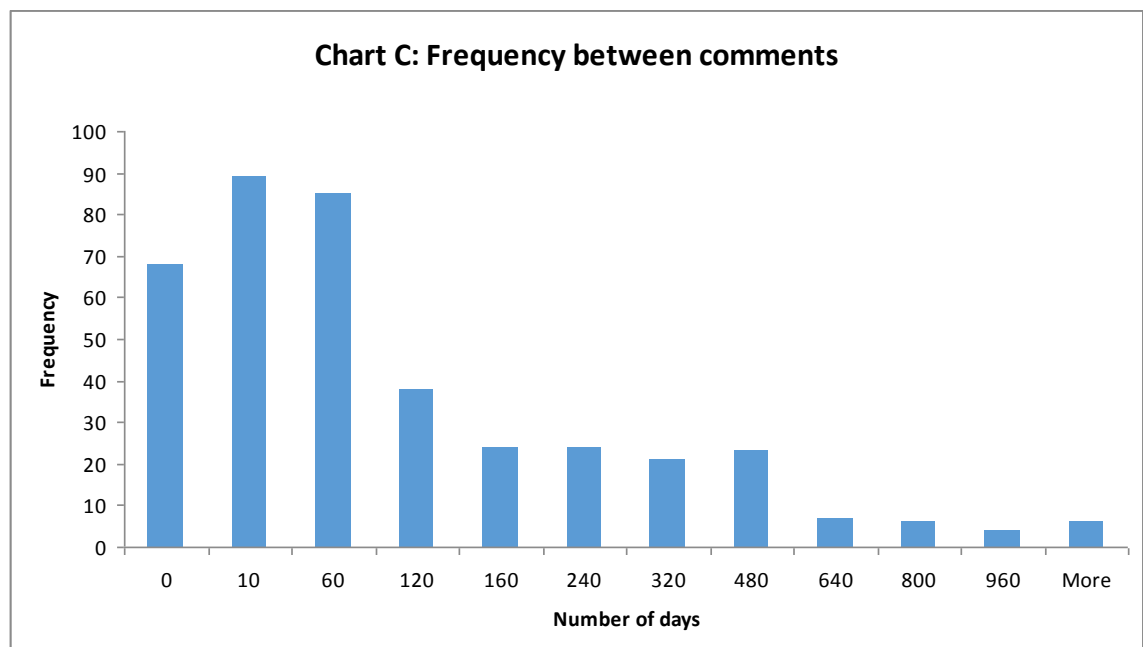
One of the main differences between these two sets of data is that the first, days between publication and comment, takes into account pages that only received one

comment. The second set, days between comments, could be significantly less due to notification emails of activity on the creator's page or comment thread directing traffic back to that page, or individuals engaged in a discussion and commenting multiple times. In either case, some pages can remain active for years before getting a comment, but the length of time alone since either publication or comment activity is not a determining factor in future participation on that page. Pages do not appear to become stagnant, but could evoke comments at any point.

Contributions

Of the 395 contributions viewed, 264 were images, 114 were text objects, 5 were sound clips and 12 were videos. Of the texts, 105 were modern and only 5 were reproductions of historical texts. Of the images, 100 were modern and 187 were historical. (See Table 3).

Table 3: Contributions, coded data summary

Contributions by Type			Contributions by Creation		
image - person	106		modern object	100	287
image - place	92	264	historical object	187	
image - thing	66		modern text	104	108
text - historical	43		historical text	4	
text - excerpt	16	114	no object	11	
text - transcription	17				
text - personal	38				
sound clip	5				
video	12				

The most frequent contributions were images, primarily people and places. There were more than twice as many images as there were texts, and audio/visual materials were contributed least of all. The most common texts contributed were historical narratives or personal stories. Texts were overwhelmingly modern. 104 were created

since 2000 (modern), and only 4 were created prior to 2000 (historical). Objects
(including images, videos, and sound clips) were roughly one third-modern and two-
thirds historical.

Of the texts submitted, 108 were written and displayed in .html format, and 6
were uploaded .pdfs. All images contributed to the sites were .jpgs. Of the images, only
58 displayed on the pages linked to a full resolution image, leaving 206 that either linked
to the scaled version or were not configured as links whatsoever. For all technical
comparisons, the largest available file was examined; however, in many cases this
required manually finding the file in a hidden folder (often called "originals") on the
website's server. Most novice users would not have the expertise to find these files,
forcing them to use the scaled images of lower resolution if they desired to save or use
the images for any other purpose. Even having found the original files, some were of no
greater quality than the scaled versions used for display. Without a standard in place of
linking scaled images to larger files, it is difficult for users to gauge if they have the best
quality file available.

Relationship between annotations & contributions

Specific content appears to evoke more participation than others (Table 4). For
texts, the number of items exceeds the number of comments in all cases except personal
text, which includes memories, anecdotes, genealogies or creative expressions. Personal
texts receive more comments than any other contribution type. In general, there are more
images than texts contributed to these community archives, but texts are less likely to
evoke participation. Images of persons or places receive more comments than images of
things, and both are at a greater likelihood to receive more than one comment than are

most other types of contributions, except for personal texts (Chart D).

Table 4: Annotations per contribution type

Type	Comments per item type (mean)
image - person	1.48
image - place	1.75
image - thing	1.11
text - historical	0.81
text - excerpt	0.81
text - transcription	0.65
text - personal	2.08
sound clip	0.80
video	0.50
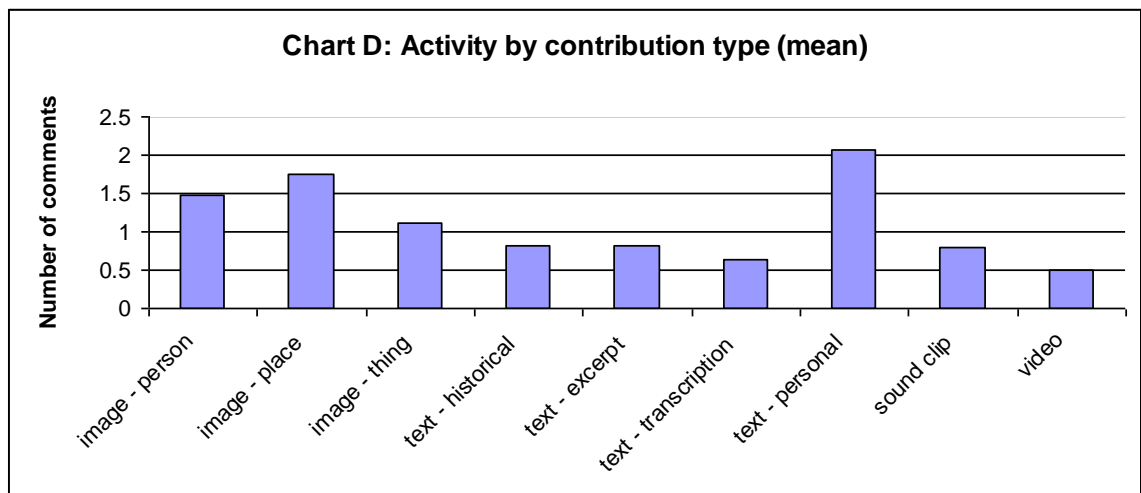
Aside from type of contribution, the origin or creation of the contribution appears to have an impact on the participation it receives (Table 5). Historical objects, a category primarily comprised of images originating prior to 2000, are the most popular contribution, and they receive more comments relative to the number of items than any other group. Modern images and modern texts, or those created after 2000, are contributed roughly equally, though texts receive slightly more comments (Chart E).

Table 5: Annotations per item creation

Creation	Comments per item (mean)
modern object	1.18
historical object	1.52
modern text	1.30
historical text	0.75

Chart E: Activity by item creation
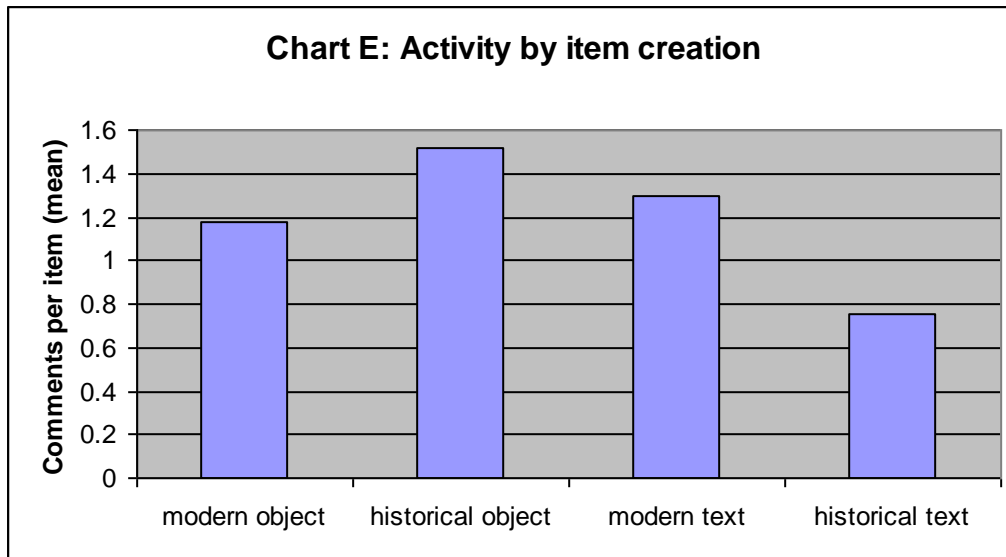
Personal connections, questions and answers are submitted in roughly equal ratios across all types of items, historical and modern (Chart F). Historical texts receive the smallest variety of comments, limited to those three categories alone. Historical objects and modern texts receive both more comments in general as well as more various types of comments, spanning all nine categories.

Chart F: Activity by type and item creation

Legend:
- copy request
- question
- personal connection
- comment
- answer
- link to more resources
- further information
- correction
- identification

Categories: modern object, historical object, modern text, historical text
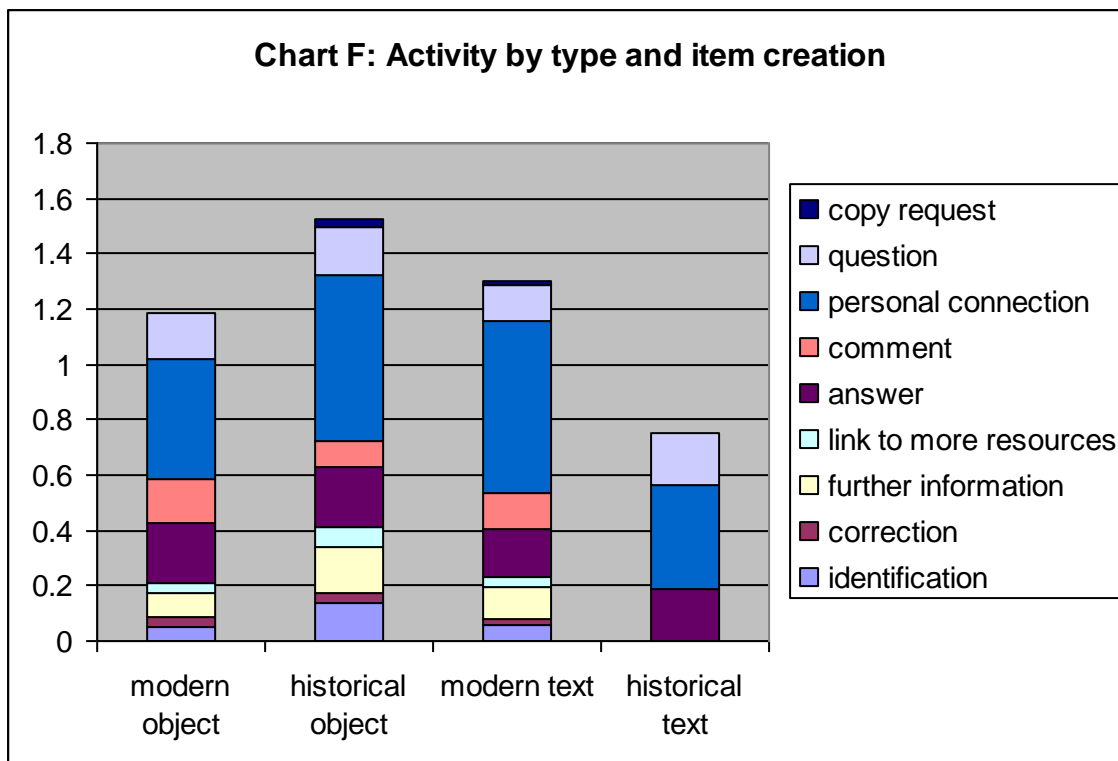
Contributions: Technical aspects

Because the original format and size is not specified for most, if any, of the

images contributed to the website, technical aspects are compared to the lowest

alternative minimum designated by FADGI guidelines (See Appendix 6). These technical

aspects for comparison do not include typical image performance specifications including

color and white balance, noise, or tone response, simply because it is assumed that

individuals scanning their own documents for contribution would not have the technical

ability or knowledge of these types of standards. Instead, the contributions are examined

for more basic and overall features, including file size, pixel array, resolution, and bit

depth (Table 6).

FADGI standards do not specify a minimum for file size, as this is linked to the

varying pixel array, resolution and bit depth. However, examining the file sizes of the

images contributed to these community archives reveals generalizations about the overall quality of contributions. The maximum file size sampled was 7.39 megabytes, and the minimum was only 3.7 kilobytes. In this wide range of file sizes, the mean was only 0.68 megabytes, and the mode was 1.97 megabytes. Generally speaking, most of the files contributed were very small relative to those you would find in an institutional repository, and this is consistent with Liew's findings at the Kete Horowhenua archive (2014).

File size aside, there are more specific file properties to consider. Pixel array determines the dimensions of the file, which FADGI recommends should be larger than 3000 pixels on the longest side if the image is not square, which none of those sampled were. Of the sampled images, 26 were wider than 3000 pixels, and 12 were taller than 3000 pixels (38 total, or 14.4%). The mean pixel array was 1238.9 pixels on the widest side, well below FADGI's recommendations. The maximum was 7015 pixels and the minimum was a mere 84 pixels.

FADGI recommends 600 dpi resolution for items approximately 4 x 5 inches, and 300 dpi for items larger than 8 x 10 inches. Again, because the original size is not specified, 300 dpi is considered acceptable for images contributed to these archives. Of those sampled, two of the images had a resolution of 1200 dpi, 19 (7.2%) were between 600 dpi and 1200 dpi, 62 (23.5%) were between 300 dpi and 600 dpi, and 183 (69.3%) were less than 300 dpi. Again, the majority of the files fell below FADGI recommendations, but this number is likely to be a very low estimate, as many of those images sampled were likely smaller than 8 x 10 inches originally.

For bit depth, 21 images were 8-bit black-and-white photos, 239 images were 24-bit, and 4 were 32-bit. Many of the 24-bit photos were actually black-and-white in their

original format, scanned unnecessarily at that depth. Although FADGI does not specify a minimum compression for low resolution scans, it requires the lowest compression for high resolution scans. Based on the size, resolution and pixel array, the files in this sample must be considered on the whole to be low resolution, so compression is not a necessary category to include, though the mean was roughly 3 compressed bits per pixel.

Table 6: Contributions, technical data summary

	File size (megabytes)	Resolution (DPI)	Pixel array (Widest side)	Bit depth
mean	0.6834	207.37	1238.91	22.848
median	0.2065	180	931	24
mode	1.97	96	590	24
max	7.39	1200	7015	32
min	0.0037	71	84	8

Overall, only 9 (3.4%) of the 264 images in the sample meet the FADGI minimums for both resolution and pixel array. The remaining 96.6% are too small and too low resolution to be considered a quality copy. While they are for the most part viewable and do offer visualization for the topics contributed to the community archive, they should not be considered adequate surrogates for the original photographs or objects. Furthermore, 8 out of the 10 total copy requests observed in the user annotations sought higher quality images.

Discussion

Overall, individual users contribute more historical items to these community archives, largely images of people and places. These items are the most popular type of contribution and they also elicit the highest number of annotations. Discussion or commentary on textual contributions is lower, except for in the case of personal narratives or memories. These contributions and user participation show that community-led cultural heritage archives are successful on at least some level, and the content being created falls within the scope of the project with little –if any– inappropriate content appearing on the sites. The individual contributions and annotations do not appear to be influenced greatly by the passage of time. Annotations may appear close to the original publication date or years apart, giving greater hope for the longevity of these types of projects. The quality of these images, however, is much poorer than a professional archive would require, yet in the long run, it must be considered that a poor reproduction is more beneficial than the absence of the item in any record.

Rather than simply being a public history project, there is a strong need for standards in particular areas in order for contributory community archives to become more effective in actual preservation of collective memory. Whenever possible, image file resolution and size should have an enforced minimum, encouraging higher quality images are being stored in the community archive's site and to be of greater use for researchers or individuals outside of the archive's environment. This could be difficult in instances where a low resolution or otherwise very small file is the only version available

to the contributor, such as in cases where the original is lost and cannot be scanned at a higher quality, so of course exceptions must always be made in order to preserve what is actually available. This study plainly shows that professional archival standards of digitization are extremely high in comparison to the actual files observed in these community archives, and perhaps the standards for these sites should be proportionately lower to meet the user's abilities, taking into account user experience and amateur practices. Although they may prevent some of materials from being displayed on community sites, standards would address many of the files observed that were entirely too small to be used in any manner, even within the own site's context. Although the UK Community Archives and Heritage Group offers general guidelines and best practices, it is ultimately up to the organizations hosting the archive to monitor and implement these practices.

All of the findings in this study are consistent with previous work in the area. In general, users respond positively to and engage with content in digital community archives, but there is much work to be done in order to ensure these archives are meeting their potential for supporting collection development for archives recording under-documented communities. Organizations like the UK Community Archive and Heritage Group are taking the necessary first steps in organizing this activity by providing a central location, advice and guidelines, and at least a basic standardization through their offering of collection building software. However, greater success with these sites would require much more than just providing the space and the platform to build it; it would also require training and understanding of the importance of archival functions that ensure quality, usability, and preservation of the materials it contains.

Conclusion

Some aspects of this study could be repeated for future research with greater attention to different aspects of data. The data collected in this study does not supply an understanding of how extensive contributory participation actually is; for example, whether a select few create the majority of the content. Because this study did not take into account unique users in collecting data on annotations, it might be helpful to understand how many of these users who comment are also contributors, as well as how often those particular users comment on items. Another aspect of interest would be to identify whether items that appear in the contributory archive appear in other places, such as state archives or another digital repository, and if they do, are they represented in a higher quality elsewhere? More detail could also be acquired regarding the relationship between the number of items in a particular collection and the instances of annotations in order to ascertain if fuller collections draw more attention and participation.

More specifically relating to archival functions, there are questions of description that could be answered about these community sites. Aspects of description were omitted from this study because, upon initial investigation, the software used to build these sites (Community Sites, promoted by the UK Community Archives and Heritage Group) only supplied metadata for whole pages rather than individual items. Therefore, is this lack of structured metadata detrimental to the archive's supposed function? Are the collections searchable, or do they rely on browsing? In light of the poor file quality found in this

study and the potentially poor descriptive aspects of these particular sites, at what point

should traditional archives be involved? Should they help create and maintain these sites

while they are built, incorporating metadata and stricter digitization standards, or should

they let the communities continue their projects as public history exhibits, and only

preserve the web pages themselves as archival products of a project in another discipline,

such as the case in Duke University's oral history project? At this point in time,

contributory community archives are a small field of study, yet these sites exemplify

Cook's "exciting prospect of being able to document human and societal experience with

a richness and relevance never before attainable" (Cook, p.113). As more and more

digital community archives emerge, coalitions and collaborative projects develop and

technology and abilities advance, projects like these should be revised and studies

revisited in order to help develop digital community archives in a way that more greatly

benefits the cultural heritage centers and other memory institutions that may be involved.

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Appendices

Appendix 1: Social media use in state archives websites

Total	State	Facebook	Twitter	YouTube	Flickr	Blog	Pinterest	Other
0	Alabama	0	0	0	0	0	0	0
0	Alaska	0	0	0	0	0	0	0
2	Arizona	1	1	0	0	0	0	0
1	Arkansas	1	0	0	0	0	0	0
0	California	0	0	0	0	0	0	0
0	Colorado	0	0	0	0	0	0	0
1	Connecticut	1	0	0	0	0	0	0
6	Delaware	1	1	1	1	1	1	0
7	Florida	1	1	1	1	1	1	1
0	Georgia	0	0	0	0	0	0	0
0	Hawaii	0	0	0	0	0	0	0
0	Idaho	0	0	0	0	0	0	0
0	Illinois	0	0	0	0	0	0	0
1	Indiana	0	1	0	0	0	0	0
0	Iowa	0	0	0	0	0	0	0
0	Kansas	0	0	0	0	0	0	0
0	Kentucky	0	0	0	0	0	0	0
0	Louisiana	0	0	0	0	0	0	0
0	Maine	0	0	0	0	0	0	0
3	Maryland	1	1	0	0	0	0	1
0	Massachusetts	0	0	0	0	0	0	0
2	Michigan	1	1	0	0	0	0	0
1	Minnesota	1	0	0	0	0	0	0
1	Mississippi	1	0	0	0	0	0	0
3	Missouri	1	1	0	0	0	0	1
6	Montana	1	1	1	1	0	1	1
1	Nebraska	1	0	0	0	0	0	0
2	Nevada	1	0	1	0	0	0	0
0	New Hampshire	0	0	0	0	0	0	0
0	New Jersey	0	0	0	0	0	0	0
0	New Mexico	0	0	0	0	0	0	0
4	New York	1	1	1	0	0	0	1
5	North Carolina	1	1	1	1	1	0	0
6	North Dakota	1	1	1	1	0	1	1
3	Ohio	1	1	1	0	0	0	0
0	Oklahoma	0	0	0	0	0	0	0
4	Oregon	1	1	1	0	1	0	0

Total	State	Facebook	Twitter	YouTube	Flickr	Blog	Pinterest	Other
0	Pennsylvania	0	0	0	0	0	0	0
3	Rhode Island	1	1	0	0	0	0	1
3	South Carolina	1	1	0	1	0	0	0
2	South Dakota	1	1	0	0	0	0	0
4	Tennessee	1	1	0	1	1	0	0
5	Texas	1	1	1	1	1	0	0
2	Utah	1	0	0	0	1	0	0
0	Vermont	0	0	0	0	0	0	0
7	Virginia	1	1	1	1	1	1	1
3	Washington	1	1	1	0	0	0	0
0	West Virginia	0	0	0	0	0	0	0
6	Wisconsin	1	1	1	1	0	1	1
3	Wyoming	1	1	0	0	1	0	0

Appendix 2: Social media use in Federation of North Carolina Historical Societies

Total	Federation of NC Historical Society Members	Facebook	Twitter	Youtube	Flickr	Blog	Pinterest	Other	No Site
1	Alleghany Historical-Genealogical Society					1			
2	Allen County Public Library	1		1	1		1	1	
0	Historic Hillsborough	1	1						
0	Anson County Historical Society								
0	Apex Area Historical Society								
0	Ashe County Historical Society	1							
2	Beaufort Historic Site	1	1				1	1	
0	Belmont Historical Society	1	1						
0	Bentonville Battlefield Historical Association								
0	Bladenboro Historical Society	1							
1	Burke County Historical Society	1	1					1	
0	C Grier Beam Truck Museum	1							
0	Caldwell Heritage Museum	1							
0	New Hanover County Cape Fear Museum	1	1		1				
0	Capital Area Preservation	1	1						
0	Carolinas Genealogical Society								
0	Carteret County Historical Society								
0	Cashiers Historical Society	1							
0	Caswell County Historical Association	1							
1	Catawba County		1			1			

Total	Federation of NC Historical Society Members	Facebook	Twitter	Youtube	Flickr	Blog	Pinterest	Other	No Site
	Historical Association								
0	Chatham County Historical Association								
0	Chicamongo Life Saving Station	1	1	1					
1	Collettsville Historical Society							1	1
0	textile heritage initiative								1
0	Davie County Historical and Genealogical Society								
0	Dry Ridge Historical Museum								
0	Currituck County Historical Society								1
0	Columbus County Historical Society								1
0	Cherryville Historical Association								1
0	Duke Homestead								
0	Duplin County Historical Society								
0	Edenton Historical Commission	1							
0	Edenton Women's Club								1
0	Eastern Cabarrus Historical Society								1
0	Federal Point Historic Preservation Society								
1	Forest History Society	1	1	1	1	1			
0	Forsyth County Historical Association								
0	Erwin Historical Society								1
0	Friends of the Page-Walker Hotel	1	1	1					
1	Frisco Native American Museum	1	1					1	
0	Friends of Haywood Hall, Inc								1
0	Gaston County Historical Society								
0	Gaston County Museum	1							
0	Gates County Historical Society								1
0	Governor Charles B. Aycock Advisory Commission								
0	Granville County Museum/Historical Society								
1	Greater Fair Bluff Historical Society							1	
0	Greene County Museum								
0	Greensboro Historical Museum	1	1						
0	Halifax County Historical Association								
0	Harrisburg Historical								1

Total	Federation of NC Historical Society Members	Facebook	Twitter	Youtube	Flickr	Blog	Pinterest	Other	No Site
	Society								
0	Henderson County Genealogical and Historical Society								
0	Hickory Landmarks Society, Inc.	1							
1	High Point Historical Society, Inc.	1	1	1				1	
0	Highlands Historical Society, Inc.								
0	Historic Bethania								
0	Historic Burke Foundation, Inc.								
0	Historic Flat Rock								
1	Historic Hope Foundation	1						1	
0	Historic Jamestown Society	1							
0	Historic Preservation Foundation of North Carolina	1	1						
0	Historic Preservation Trade Program / Edgecombe Community College								1
0	Historic Richmond Hill Law School Commission								1
0	Historic Rockwell Association								
0	Historic Rosedale Foundation, Inc.	1	1		1				
1	Historic Stagville	1						1	
0	Historical Preservation Group of Lenoir County								
0	Huguenot Society of North Carolina								
0	Hyde County Historical and Genealogical Society								
1	International Lineman's Museum & Hall of Fame	1	1					1	
0	Joel Lane Museum House	1							
0	Johnston County Heritage Center	1							
0	Jones County Historical Society								
1	Kernersville Historical Society					1			
0	Lawndale Historical Society								
0	Lewisville Historical Society								
0	Lincoln County Historical Association	1	1						
0	Lower Cape Fear Historical Society	1							
0	Mattamuskeet Foundation								
0	Matthews Historical	1							

Total	Federation of NC Historical Society Members	Facebook	Twitter	Youtube	Flickr	Blog	Pinterest	Other	No Site
	Foundation								
0	May Museum and Park								
0	Mebane Historical Society & Museum								
0	Mecklenburg Historical Association								
0	Moore County Historical Association	1							
0	Moores Creek Battleground Association								
0	Mount Airy Museum of Regional History	1	1						
0	Mount Holly Historical Society	1							1
0	Murfreesboro Historical Association								
0	National Railroad Museum and Hall of Fame	1							1
1	New Bern Historical Society Foundation, Inc.	1						1	
0	North Carolina Association of Historians								
0	North Carolina Friends Historical Society								
1	North Carolina Genealogical Society							1	
0	North Carolina Literary and Historical Association								
0	North Carolina Military Historical Society								
0	North Carolina Presbyterian Historical Society								
0	North Carolina Railway Museum	1		1					
0	North Carolina Society of Historians								
0	North Carolina Supreme Court Historical Society								
0	Ocracoke Preservation Society, Inc	1							
1	Old Hickory Council, Boy Scouts of America							1	
0	Old Salem Museums and Gardens	1							
0	Operation North State	1							
0	Outer Banks Conservationists, Inc.	1	1	1	1				
0	Pender County Historical Society								1
0	Perry-Weston Educational and Cultural Institute								

Total	Federation of NC Historical Society Members	Facebook	Twitter	Youtube	Flickr	Blog	Pinterest	Other	No Site
0	Person County Historical Society								1
0	Phoenix Society for African American Research, Inc.								1
0	Pitt County Historical Society								
1	Preservation Durham	1	1					1	
1	Preservation Society of Chapel Hill	1	1		1			1	
0	Railroad House Historical Association								
0	Raleigh City Cemeteries Preservation, Inc.								
0	Raleigh City Museum								1
0	Raleigh Historic Districts Commission								
0	Raleigh Historic Districts Commission	1	1	1					
0	Richmond County Historical Society, Inc.								1
0	Rowan Museum, Inc.	1							
1	Salem Services Group	1	1					1	
0	Sampson County Historical Society								
0	Sandhills Family Heritage Association								
1	Society of North Carolina Archivists	1	1			1			
0	Southport Historical Society								
1	St. Joseph's Historic Foundation	1	1		1			1	
0	Stanly County Historic Commission and Museum	1	1						
0	Swansboro Historical Association, Inc.								
0	Town of Granite Falls								
0	Transylvania County Historical Society, Inc.								
0	Valleytown Cultural Arts and Historical Society, Inc.								
0	Vance County Historical Society								1
0	Wachovia Historical Society								
0	Wake County Historical Society								
0	Walkertown Historical Society	1							
0	Warren County Historical Association								1
0	Wayne County Historical Association	1			1				
0	Wendell Historical Society	1							
0	Western North								

Total	Federation of NC Historical Society Members	Facebook	Twitter	Youtube	Flickr	Blog	Pinterest	Other	No Site
	Carolina Historical Association								
1	William P. Cumming Map Society	1						1	
0	Wilson County Historical Association								1
0	World War II Wilmington Home Front Heritage Coalition								
0	Yadkin County Historical Society	1							1

Appendix 3: Codebook for annotations

Adapted from Jessica M. Sedgwick, 2008.

Category	Description
identification	identification of subject (person, place, thing) not already identified
correction	correction to existing metadata
further information	further information about subject such as date, explanation of contextual information
link to more resources	links and references to resources for further information, including websites, books, and email addresses of those with personal knowledge to offer, or providing excerpts from related materials
answer	answers to questions posed by other users (back-and-forth communication)
comment	general comments (non-informational), opinions, or praise
personal connection	establishing personal connection to subject, such as noting a family member, genealogical information, providing an anecdote, etc.
question	asking questions
copy request	request for copies of materials
no activity	no annotations from individual users
disabled	annotations disabled or site in progress

Appendix 4: Codebook for contributions

Category	Description
image - person	image of a person or a group, identified or not
image - place	image of a place, identified or not
image - thing	image of an artifact, artwork, item, document,etc.
text - historical	a researched historical narrative, interpretation, genealogy, biography or timeline of events
text - excerpt	excerpts from a secondary source, including books, journals, other websites, or general information and referrals for local services or attractions.
text - transcription	transcription or replication of a primary source (such as legal documents, newspaper articles, letters, etc.), oral history or interview, or poetry or prose not created by the contributor.
text - personal	text relaying a recollection, memory, other personal anecdote or original artistic text (prose, poetry) written by the contributor
sound clip	audio recording; examples: oral history, speech, etc.
video	embedded video clip
Creation Category	**Description**
modern object	image is a modern photograph, video, or audio originating roughly within the past 15 years.
historical object	image is a scan of a historical photograph or shared archived video, originating in the 20th century or prior
modern text	text created for the website by the contributor, or excerpts from another modern source
historical text	transcription of historical text, not written by contributor or contemporaries
no object	administrative page, page unfinished, or no object for other reason

Appendix 5: Community archive directory for data collection

Site number	Archive name	Web address
1	The Hadleigh & Thundersley Community Archive	http://www.hadleighhistory.org.uk
2	Louisburgh & Killeen Heritage	http://www.louisburgh-killeenheritage.org
3	Tilbury and Chadwell Memories	http://www.tilburyandchadwellmemories.org.uk
4	Our Irish Heritage	http://www.ouririshheritage.org
5	Our Dacorum	http://www.ourdacorum.org.uk
6	Our Hatfield	http://www.ourhatfield.org.uk
7	Our Hertford and Ware	http://www.ourhertfordandware.org.uk
8	Billericay History	http://www.billericayhistory.org.uk

Site number	Archive name	Web address
9	Laindon and District Community Archive	http://www.laindonhistory.org.uk
10	The Rochford District Community Archive	http://www.rochforddistricthistory.org.uk
11	Our Oxhey	http://www.ouroxhey.org.uk
12	Our Broxbourne	http://www.ourbroxbourne.org.uk
13	Our Stevenage	http://www.ourstevenage.org.uk
14	Our Welwyn Garden City	http://www.ourwelwyngardencity.org.uk
15	Our Letchworth	http://www.ourletchworth.org.uk
16	Sussex Deaf History	http://www.sussexdeafhistory.org.uk
17	Benfleet Community Archive	http://www.benfleethistory.org.uk
18	WRVS Heritage Plus	http://www.memorywall.org.uk
19	The Canvey Community Archive	http://www.canveyisland.org
20	East Brighton Bygones	http://www.bygones.org.uk
21	My Brighton and Hove	http://www.mybrightonandhove.org.uk

Appendix 6: FADGI (2010) Alternative minimums for digitization of photographs and prints

Photographs - Prints - Black-and-White, Monochrome, and Color	Pixel Array: 3000 pixels across long dimension for all rectangular formats and sizes; 2700 pixels by 2700 pixels for square formats regardless of size
	Resolution: Scan resolution calculated from actual image dimensions – approx. 2100 dpi for 35mm originals and ranging down to the appropriate resolution to produce the desired size file from larger originals, approx. 600 dpi for 4"x5" and 300 dpi for 8"x10" originals
	Bit Depth: 8-bit grayscale mode for black- and-white, can be produced from a 16-bit grayscale file; 24-bit RGB mode for color and monochrome (e.g. collodion wet-plate negative, pyro developed negatives, stained negatives, etc.), can be produced from a 48-bit RGB file