Measuring Perceptions of Trustworthiness: A Research Project

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ABSTRACT
The digital curation and preservation community has long acknowledged that trustworthiness is a critical component of successful digital repositories. However, there is no known method to determine if or under what circumstances an end-user perceives a repository as trustworthy. While the research literature describes definitions, criteria, and certification processes that allow repository managers to assert trustworthiness under certain conditions, it does not adequately define, measure, or specify trustworthiness from the perspective of the end-user. This paper highlights traditional notions of trustworthiness in the context of the literature on digital repositories and explores trustworthiness from the end-user's perspective. The paper also presents an ongoing research project to: (1) investigate designated communities' perspectives on trustworthiness using focus groups, and (2) explore building, testing, and assessing an index to measure trustworthiness.

Categories and Subject Descriptors
H.1.2 [**Information Systems**]: User/Machine Systems – human factors, human information processing.

General Terms
Human Factors, Measurement, Reliability, Verification.

Keywords
Digital Curation, Digital Preservation, End-Users, Perceptions, Psychometrics, Trusted Digital Repositories, Trustworthiness.

1. INTRODUCTION
In the field of digital curation and preservation, repositories are asserted as "trusted" or "trustworthy" if they meet certain conditions encoded in best practices and standards. For example, the *Trustworthy Repositories Audit and Certification: Criteria and Checklist* (TRAC) is designed to measure and document the procedures and processes used to build and manage a repository and protect its content from corruption. The type of trustworthiness repositories that abide by these standards and best practices assert is very specific, having to do with a repository's ability to sustain itself and preserve digital materials [12].

Recently, empirical research studies have advanced our understanding of the extent to which end-users accept repositories as special domains of managed information. This type of work has also begun exploring the end-user experience of accepting the trustworthiness repositories assert by examining the factors that affect users' perceptions of trustworthiness [1, 2, 6, 15, 17]. These studies' findings disagree on whether the type of trustworthiness repositories assert is the same as the type of trustworthiness end-users of these repositories accept. All of this makes end-user trustworthiness perception a vibrant and interesting area of research.

This research project focuses more specifically on the notion of repository trustworthiness by taking the position that end-user perception of trustworthiness for individual documents or clusters of documents in a repository may affect perception at the repository level. The study also takes into account the idea that users can perceive trustworthiness in two ways: (1) as binary (e.g., trustworthy or untrustworthy), or (2) as a spectrum with a range of perceptions (e.g., more trustworthy or less trustworthy), based upon a wide range of factors. In addition, the study contextualizes end-user perception for a specific user group who uses specific types of documents from one repository, namely genealogists using marriage, death, birth, and family history records from the Washington State Digital Archives (WADA).

The purpose of this study is two-fold: (1) to investigate designated communities' perspectives on trustworthiness, and (2) to consider the extent to which trustworthiness is measurable as a construct of end-user perception for repository documents. This paper explicates details about focus groups and the method of index construction in an attempt to address both thrusts of the study's purpose. The focus groups will engage members of a designated community in conversation about their perceptions of trustworthiness for documents they have encountered while using WADA, and especially, how they develop those perceptions. Then, a multi-stage index construction process builds on those results and existing measures of trustworthiness to explore the extent to which a validated, multi-item index for assessing end-user perception of trustworthiness for repository documents can be obtained.

2. LITERATURE REVIEW
2.1 Asserting Trustworthiness
Examining the titles of significant international project reports and validation/certification programs demonstrates that, by and large, the digital curation and preservation communities conceptualize trustworthiness as a property that repository managers can assert over their repositories if they meet certain criteria. The *Trustworthy Repositories Audit and Certification: Criteria and Checklist* [12] specifies that if a repository adheres to specific criteria regarding organizational infrastructure, digital object management, and technical infrastructure, including security issues, it can be considered trustworthy. Consonantly, the *NESTOR Catalogue of Criteria for Trusted Digital Repositories* [10] delineates criteria for a repository's organizational framework, object management, infrastructure, and security that,

if met, result in repositories attaining trusted status. The *Digital Repository Audit Method Based on Risk Assessment* (DRAMBORA) [5] notes that if a repository identifies and properly manages threats to preserving digital materials, it can be considered trustworthy. The Data Archiving and Networked Services (DANS) – Data Seal of Approval (DSA) [7] outlines guidelines for the data producer, data consumer, and data repository that, if met, allow a repository to emboss an actual seal of approval on its website as an attestation of its trustworthiness. Similar to the other guidelines/standards, "[t]he seal of approval does not express any views regarding the quality of the data to be archived, but does regarding the provisions an archive has made to guarantee the safety and future usability of the data" [7, n.p.]. Often, the type of trustworthiness that repositories (which abide by these standards and best practices) assert focuses on a repository's ability to sustain itself and preserve digital materials.

2.2 Factors Affecting End-User Trustworthiness Perception

Despite differences in the type of repository, the type of content used, the type of user, and the purpose for using content from a repository, existing empirical research on trustworthiness perception for end-users of digital repositories suggests that a variety of factors affect their perception at both repository and document levels. Specifically, at the repository level, prior experience, institutional/organizational reputation, and third party endorsement are among the factors that affect end-user trustworthiness perception. At the document level, the author/creator/producer of the information, peer review, institutional/organizational reputation, a document or dataset's presence in a repository, and use purpose are among the factors that affect end-user perception of trustworthiness. In addition, findings vary regarding the extent to which repository level trustworthiness perception interacts with trustworthiness perception at the document level.

2.2.1 Factors Affecting End-User Trustworthiness Perception at the Repository Level

A user's prior experience with a repository is a factor that can help in determining the trustworthiness of a repository. St. Jean et al. [15] found that end-users base their perceptions of whether a repository is trustworthy on their prior experience with that repository. Specifically, the findings suggest that the more positive experiences end-users have with repositories, the more trustworthy they perceive those repositories to be. Likewise, participants in the Conway [2, p. 455] study perceived the repository they dealt with as trustworthy because of having "consistently positive experience in obtaining relevant, useful, and technically appropriate" content.

In addition to their own experience with repositories, users consider others' experiences as well, via the repository's reputation or track record. The CASPAR Consortium [1] found that users of curated digital objects rated the track record of a repository's ability to curate objects the most important factor among sixteen others in determining if a repository is trustworthy. Similarly, Yakel et al. [17] found that both archaeologists and quantitative social scientists mentioned institutional reputation as an important trustworthiness factor. Specifically, quantitative social scientists were twice as likely to mention the importance of

institutional reputation as compared to archaeologists. Furthermore, novice quantitative social scientists were twice as likely to mention the importance of institutional reputation as expert quantitative social scientists.

Users' first-hand experiences are seemingly more important to their perceptions of trustworthiness than external factors like certification. While in their study, Ross and McHugh [13] took as axiomatic that certification is one marker that helps users determine the trustworthiness of a repository, subsequent studies that collected data from actual users of digital repositories show that third party endorsement might not be key in determining the trustworthiness of a repository. For example, the CASPAR Consortium [1] found that users of curated digital objects rated the fact that a repository has been validated by a toolkit such as DRAMBORA or TRAC and the fact that a repository has been validated by a domain-specific authority such as the Museums Documentation Association (MDA) among the least important factors in determining the trustworthiness of a repository. Similarly, in the Yakel et al. [17] study, only one quantitative social scientist cited seals of approval, a form of third party endorsement, as a factor that positively influences trustworthiness perception.

2.2.2 Factors Affecting End-User Trustworthiness Perception at the Document Level

Across multiple studies, the importance of the author/creator/producer of the content is an important factor for some end-users in determining the trustworthiness of repository content. For example, faculty, library staff, museum staff, undergraduate and graduate students in the St. Jean et al. [15] study were concerned about who created the content and why. People engaged in environmental planning including professionals employed by state, local, and federal agencies, representatives of environmental organizations and industry, concerned residents, and landowners in the Van House et al. [16, p. 340] study wanted not only to know who created the content, but to understand the extent to which the creator "followed the appropriate scientific practices" as part of their determination of the "trustability" of a dataset. Study participants also indicated that they needed to know the reputation of the content creator in order to determine the trustability of a measurement dataset. In contrast, in the Fear and Donaldson [6] study, awareness of a content creator's reputation was insufficient grounds for perceiving a dataset as trustworthy. According to the faculty members, postdoctoral fellows/researchers, staff scientists, and consultants in the study, some scientists with good reputations make "crap data" available while some other relatively unknown scientists create very trustworthy data.

Prior research suggests that if some end-users assume or know content has been subject to peer review, they will perceive that content as more trustworthy than they would otherwise. For example, in the St. Jean et al. [15] study, some faculty, library staff, museum staff, undergraduate and graduate students perceived institutional repository content as more trustworthy because they were under the impression that the content was subject to some sort of peer review process. In the Fear and Donaldson [6] study, the faculty members, postdoctoral fellows/researchers, staff scientists, and consultants were aware of the fact that not all the datasets in the proteomics repository had

been subject to peer review. In response, study participants actively sought out datasets that were associated with published articles and perceived those datasets as more trustworthy than other datasets that were unassociated with publications. The reason the study participants had such positive trustworthiness perceptions for datasets that were associated with publications was because, in the field of proteomics, both publications and their associated data are peer reviewed. In contrast to some of the other studies, the repository under investigation in the Van House et al. [16] study housed unpublished material and the study participants understood that the content had not been peer reviewed. Thus, participants did not rely on peer review to serve as a heuristic for perceiving content encountered within the repository as either trustworthy or untrustworthy, as some respondents in the St. Jean et al. [15] study assumed they could, or as some participants in the Fear and Donaldson [6] study actually could.

In the St. Jean et al. [15] study, faculty, library staff, museum staff, undergraduate and graduate students indicated that a repository's tie with an institution positively influences their perceptions about the trustworthiness of the content they find. They assumed that an institution would not allow information that was untrustworthy to be made available via the repository, because they assumed the institution would not jeopardize its own reputation by providing untrustworthy information.

For some end-users, the presence of a dataset in a repository serves as an indication of its trustworthiness. Fear and Donaldson [6] found that some proteomics researchers believe that a scientist's willingness to make his or her data available in a repository demonstrates that it is trustworthy enough to be used by others. These study participants subscribed to the idea that data producers would not willingly make untrustworthy data available because doing so could jeopardize a data producer's reputation.

Levy [9] first pointed out that the use to which digital documents will be put is an important consideration that should guide choices about digital preservation. Subsequent empirical research suggests that use purpose is moderated by end-user trustworthiness perception for documents preserved in a repository. For example, in the Fear and Donaldson [6] study, participants perceived some of the preserved datasets as trustworthy enough to replicate the analysis of the data creator, but those same data were not perceived as trustworthy enough to actually understand the biology behind the data, and were thus insufficient for that use purpose.

2.3 The Interaction of Repository and Document Level Trustworthiness Perception

Results vary regarding the extent to which repository and document trustworthiness perceptions interact. Conway [2, p. 455] found that, for his study participants, trustworthiness "ascends to the organizational level and, as a consequence, pervades the resources delivered digitally." In contrast, Yakel et al. [17, p. 11] found that "[t]rust in the repository is a separate and distinct factor from trust in the data." Taken together, the findings motivate a need for more research to better understand when repository trustworthiness perceptions affect document trustworthiness perceptions, and when they do not.

2.4 End-User Conceptualization of Trustworthiness

In the St. Jean et al. [15] study, repository end-users articulate their conceptualization of trustworthiness in a way that suggests it is multi-faceted for them. They interpreted "trustworthy" as comprehensive, factual, legitimate, professional, reliable, reputable, updated, and verifiable.

2.5 Summary of Literature as Motivation for Study

Taken together, the literature demonstrates that trustworthiness is central to justification for digital repositories, but it has only been asserted as a concept. Trustworthiness has not been defined in a way that is amenable to verifying its presence or absence in a repository context from the end-user's perspective. The research on end-users has identified factors that affect their perception of trustworthiness at both repository and document levels. These findings provide insight into assumptions end-users make about the type of trustworthiness repositories assert. Existing empirical research also suggests that end-user conceptualization of trustworthiness is multi-faceted [15]. For any repository, understanding how their designated communities conceptualize trustworthiness is necessary, as is measuring trustworthiness perception based upon that conceptualization. This paper describes the development of a composite measure for assessing designated communities' concept of trustworthiness.

3. A RESEARCH PROJECT

3.1 The Washington State Digital Archives (WADA) as the Primary Site of Study

The research study centers on end-user perception of trustworthiness for preserved documents found in digital repositories. In order to conduct the investigation, the Washington State Digital Archives (WADA) will serve as the primary site of study for five reasons. First, WADA is a highly utilized digital cultural heritage resource. Approximately 500,000 people visit WADA per year with thousands of unique visitors per month. Second, WADA has a strong and explicit mission statement, which focuses on making preserved digital information accessible to users. Third, WADA has had a great deal of success in administering web surveys to their users. Fourth, the author can access WADA data relatively seamlessly because of an established relationship with WADA administrators. Fifth, in action and deed, WADA is a Trusted Digital Repository (TDR) that abides by leading practices and standards for organizational infrastructure, digital object management, and technical infrastructure, including security issues, consistent with TRAC specifications, despite not being formally certified as a TDR as of April 2013.

This study focuses on genealogists, who represent WADA's largest designated community (personal communication with WADA staff, March 8, 2013). Also, based on WADA's download statistics, genealogical records are among WADA's most highly downloaded records. For these designated community members, most of the records they utilize are digitized records available for download in JPEG format accompanied by transcriptions. In some cases, only the digitized record is available, and in other cases, only the transcribed version is available.

3.2 Focus Groups

Before attempting to build, test, and assess an index to measure the construct of trustworthiness, one must understand designated communities' perspectives on trustworthiness. According to Stewart and Shamdasani [14], one of the uses of focus groups is to learn about how respondents talk about a phenomenon. The research study will use focus groups to collect data from genealogists to understand their perspectives on trustworthiness.

To recruit participants, WADA staff will forward a description/invitation for the study to users who they know have a track record of using WADA. Those interested will utilize the contact information provided in the study description to call or email the author directly and finalize arrangements for participating in the focus groups. The target size of each focus group is six to eight participants.

Each participant will take a paper-based pre-survey before the focus group begins. It will include the following questions/prompts:

1. On average, how frequently do you use the Internet?
2. How strongly do you agree with the following statement: In general, I trust information I find on the Internet.
3. In the last year, how frequently have you used the Washington State Digital Archives?
4. What is your primary reason for visiting the Washington State Digital Archives?
5. How strongly do you agree with the following statement: I usually find the documents I'm looking for when using WADA.
6. How strongly do you trust the documents you find when using the Washington State Digital Archives?
7. How satisfied are you with the way the Washington State Digital Archives displays documents?

Question 1 engages participants' Internet usage. Question 2 examines participants' disposition to trust information found on the Internet broadly speaking. Question 3 is useful for understanding the extent to which the study participants have a track record of using WADA. Question 4 focuses on participants' primary reason for using WADA. Questions 5-7 investigate participants' experiences with and perceptions of WADA documents. In addition, the pre-survey includes two demographic questions related to participants' age and gender.

To maximize breadth and depth of discussion in the focus groups, the author will ask the following open-ended questions/prompts:

1. Discuss the nature of the documents you use when using WADA and your purpose(s) for using them.
2. Discuss your perceptions of trustworthiness for the documents you find using WADA.
3. How would you describe a document you found in WADA that you think is trustworthy?
4. Under what circumstances would you question the trustworthiness of a document you encountered while using WADA?
5. Card-sorting exercise.

Question 1 is designed to be an "icebreaker" question, which, according to Stewart and Shamdasani [14], is how any focus group should begin. The question engages participants' use of WADA, including their purposes. Questions 2-4 specifically engage trustworthiness in the context of WADA and for documents encountered within it. Question 5 is a card-sorting exercise in which participants will break into pairs and sort potential trustworthiness perception attributes into three piles in terms of how important they think they are for the documents they use: important, somewhat important, and not important. After participants complete the card-sorting exercise, we will discuss how and why each pair grouped the attributes the way they did.

The focus groups will take place on-site at WADA and be videotaped. Each focus group will last for approximately an hour and a half. The resulting data will be transcribed and analyzed using nVivo 9.0. Overall, the focus groups will inform our understanding of these designated community members' perspectives on trustworthiness, including their conceptualization of the construct, laying the groundwork for the next phase of the research project.

3.3 The Index Construction Process

There are four steps to an index construction project, including: (1) construct definition, (2) generating an item pool, (3) designing the index, and (4) full administration and item analysis [4].

3.3.1 Implementing Step 1 – Construct Definition

Step 1 involves completion of three tasks related to defining trustworthiness. First, development of a brief definition of trustworthiness, including its scope and any subcomponents that are to be included. Second, further development of the definition of trustworthiness by drawing upon existing definitions from relevant research studies and theoretical literature published in digital preservation and curation, communication studies, information science, and web credibility domains. Third, operationalization of the construct definition of trustworthiness by: (1) considering the different types of questions or rating scales to which study participants can respond, and (2) asking oneself what kinds of responses would be clear indicators of the respondents' levels or amounts of perceived trustworthiness.

3.3.2 Implementing Step 2 – Generating an Item Pool

To implement Step 2, a number of tasks will be completed related to generating an item pool for the construct of trustworthiness. Any existing instruments that measure trustworthiness will be examined. Items from those instruments will be selected as a starting point for the initial item pool. If these instruments do not exist, related instruments will be examined, which may contain items that are acceptable for inclusion. If no items in existing or related instruments are appropriate, the researcher will create them. In addition, ideas for items will be gathered from reviewing the literature on trustworthiness. Items will also be generated from members of WADA's largest designated community (i.e., genealogists) who will be asked to articulate, during the focus groups, adjectives to describe documents they think are trustworthy. These trustworthiness attributes will be reviewed to assess the extent to which they compare or contrast with: (1) items found in the literature, and (2) items experts recommend.

By manual inspection, pretesting with a small sample of respondents, and conferring with experts, a host of issues that must be considered during Step 2 will be addressed, which include [4]:

- ensuring each item expresses only one idea
- avoiding lack of colloquialisms, expressions, and jargon
- ensuring the reading difficulty matches the reading level of respondents
- ensuring the items match the specificity of trustworthiness
- ensuring that what the items have in common is trustworthiness and not merely a category
- ensuring that the item pool consists of an exhaustive list of items that appear to fit trustworthiness
- avoiding exceptionally lengthy items
- making items as short and as uncomplicated as possible.

Expert involvement will play a major role in Step 2. The researcher will assemble a panel of trustworthiness experts to evaluate the entire initial item pool. In a self-administered web survey, the experts will be provided the construct definition developed during Step 1 and then they will be provided with the initial item pool. The survey instructions will ask the experts to rate each item with respect to trustworthiness according to the following designations: essential, useful but not essential, or not necessary. Experts' responses will be analyzed by computing a Content Validity Ratio (CVR) for each item [8]. For purposes of this study, all items that have positive CVRs will be retained for the trustworthiness item pool. In addition, the instrument will ask experts to: comment on individual items as they see fit, evaluate the items' clarity and conciseness, point out awkward or confusing items, suggest alternative wordings, and suggest additional items.

3.3.3 Implementing Step 3 – Designing the Index

Step 3 involves a number of activities related to the format of the index, including: selection of response categories and choices, writing item stems, and writing instructions. This step also involves pretesting.

The definition of trustworthiness developed during Step 1, coupled with the researcher's understanding of the literature on index construction for Step 3, will guide selection of response categories and choices.

Following the recommendation of authors on the topic of index construction [4], the researcher anticipates choosing seven response choices. This odd number of choices will allow respondents the option of neutrality if particular items are neither important nor unimportant to them. In addition, seven response options will allow a greater level of granularity with respect to the resulting data. The various gradations of importance will enable the researcher to discover if and to what degree items are important or unimportant to end-users.

Item stems will be written with the construct of trustworthiness in mind. As well, item stems will be written with the response

categories in mind; they will be made as clear, concise, unambiguous, and concrete as possible.

The item pool instrument will be administered as a web survey because WADA end-users are geographically dispersed. Thus, administering the item pool instrument as a web survey would make it much more feasible for respondents to participate in the project.

Step 3 will also include informal pretesting and formal pilot testing of the draft instrument including cognitive interviews. For the informal pretesting, members of the Archives Research Group (ARG) at the University of Michigan School of Information will be recruited and emails will be sent out on student listservs to recruit Master's and Ph.D. students. Each participant will be asked to indicate if any items are ambiguous or confusing, or if they feel any items cannot be rated along the response categories and choices provided by the instrument. The index will be revised on the basis of participants' feedback. For the formal pilot testing, the researcher will travel to Washington to administer the index to a small group of actual WADA end-users, which WADA staff will help identify and recruit. Each respondent will complete the instrument in a private setting in the WADA Reading Room while the researcher is present. Each respondent will be asked to think aloud. Similar to the pretest participants, the pilot test participants will also be asked to indicate which items are ambiguous or confusing, and which items cannot be rated along the instrument's response categories and choices. This type of evaluation will be used to identify items that are not clear, items that are being interpreted in ways that are different from how they were intended, as well as instructions that are vague or ambiguous.

3.3.4 Implementing Step 4 – Full Administration and Item Analysis

To implement Step 4, the item pool generated during Step 2 and pretested in Step 3 will be administered as an instrument and item analysis and factor analysis will be conducted. After each statistical test, the results will be used to further improve the instrument, deleting or revising any items that are not contributing to its quality. This iterative process will continue until the instrument is of sufficient quality.

The sample population for this study will be actual WADA end-users from its largest designated community. The instrument will be administered to these users as an intercept survey [3]. For example, every 200th visitor will receive a pop-up invitation to participate in the study. This form of probabilistic sampling (i.e., systematic sampling) is a practically viable way of making sure actual WADA end-users participate randomly in the survey. In addition, screening questions will enable the researcher to identify those participants who self-report as genealogists.

The number of participants for the study will be a function of the number of items in the instrument. Specifically, the researcher will follow Nunnally's [11] recommendation of between 4 and 10 participants per item.

After administering the instrument to a sample of WADA end-users, several characteristics of individual items will be evaluated.

During item analysis, the researcher will examine item-scale correlations, item variances, and item means.

To assess intercorrelation, the researcher will compute item-index correlations for each item. Corrected item-index correlation will be computed, rather than uncorrected item-index correlation because the latter could inflate reliability [4]. The researcher will also assess item variances by examining the range of responses for each item, anticipating retaining response items broadly, per DeVellis's [4] recommendation.

Both item-index correlations and coefficient alpha will be used to choose items for an index. Depending on the findings, a series of steps may be taken, such as deleting some items, checking alpha, deleting more items, and rechecking alpha, until a final set of items is chosen.

During factor analysis, varimax rotation will be conducted and scree plots will be generated, paying close attention to those factors which have the highest eigenvalues. The results of the factor analysis will be examined to see if they make logical sense or make sense in light of existing theory.

Although item-index correlations may be used from a statistical perspective to understand the extent to which certain items relate and could therefore be useful for measuring trustworthiness, results of statistical analyses will not be relied upon solely to build the index. The researcher will consider theoretical and practical understanding of the items in light of statistical calculations prior to finalizing conclusions about what is being measured.

After administering the item pool as an instrument and completing item analysis and factor analysis on the data, a modified version of the index may be administered to another sample of WADA end-users, performing item analysis and factor analysis on the resulting data. The goal of Step 4 is to achieve an internally consistent and logically sensible instrument. Administering a modified version of the index may or may not be necessary. It will be dependent on results of the first item analysis and factor analysis; the researcher's subjective judgment; and consultation with specialists with expertise in researching trustworthiness regarding whether the items the statistics suggest correlate make sense to be considered together.

4. CONCLUSION & SIGNIFICANCE

The research project is significant because it attempts to answer one of the most important questions in the digital curation and preservation research domain, "When is a repository trustworthy?" Specifically, the study is designed to:

- explore what trustworthiness means to actual end-users
- operationalize trustworthiness, and
- measure trustworthiness.

There is value in conducting this study regardless of the outcome. If completion of Steps 1 through 4 result in an internally consistent and logically sensible instrument, then the instrument's mere existence validates claims by researchers that complex

constructs cannot be measured reliably using one item [8], and that trustworthiness is no exception. Further, the instrument will provide a specific composite operationalization of the construct of trustworthiness which could be tested for validity in various contexts, such as with documents found in TDRs besides WADA. If completion of Steps 1 through 4 does not result in an internally consistent and logically sensible instrument, substantial insight will be discovered concerning the challenges to measuring trustworthiness. This specific outcome would suggest that more conceptual work needs to be done on trustworthiness.

Ultimately, investigating and measuring trustworthiness is precisely the type of work digital curation and preservation researchers need to conduct to understand and monitor designated communities' perceptions of trustworthiness for repositories. This paper describes an ongoing research project with a methodology to administer such a process. The timeframe for this project is approximately one year from start to finish and is broken into four main phases: Step 1 (February 1, 2013 – April 30, 2013), Step 2 including focus groups (May 1, 2013 – July 31, 2013), Step 3 (August 1, 2013 – August 31, 2013), Step 4 (September 1, 2013 – November 30, 2013), data analysis and report writing.

5. ACKNOWLEDGMENTS

6. REFERENCES

[1] CASPAR Consortium. 2009. Report on Trusted Digital Repositories. Technical Report.

[2] Conway, P. 2010. Modes of seeing: Digitized photographic archives and the experienced user. *American Archivist* 73(2): 425-462.

[3] Couper, M. P. 2000. Review: Web surveys: A review of issues and approaches. *Public Opin. Q.* 64(4): 464-494.

[4] DeVellis, R. F. 2012. Scale development: Theory and applications. Thousand Oaks, Calif.: SAGE.

[5] Digital Curation Centre and Digital Preservation Europe. 2007. *DCC and DPE Digital Repository Audit Method Based on Risk Assessment*, v.1.0. Technical Report.

[6] Fear, K. and Donaldson, D. R. 2012. Provenance and Credibility in Scientific Data Repositories. *Archival Science* 13(1): 55-83.

[7] Harmsen, H. 2008. Data seal of approval - assessment and review of the quality of operations for research data repositories. *Proceedings of the Fifth International Conference on Preservation of Digital Objects* (St. Pancras, London, Sept. 29-30, 2008). iPres'08. 1-3.

[8] Kim, Y. 2009. Validation of psychometric research instruments: The case of information science. *J. Am. Soc. Inf. Sci. Technol.* 60(6): 1178-1191.

[9] Levy, D. M. 1998. Heroic measures: Reflections on the possibility and purpose of digital preservation. *Proceedings of the Third ACM Conference on Digital Libraries* (Pittsburgh, Pennsylvania, USA). DL'98.

[10] NESTOR Working Group on Trusted Repositories Certification. 2009. Catalogue of criteria for trusted digital repositories Version 2. Deutsche Nationalbibliothek: NESTOR Working Group.

[11] Nunnally, J. C. 1978. *Psychometric theory*. New York: McGraw-Hill.

[12] RLG-NARA Digital Repository Certification Task Force. 2007. Trustworthy repositories audit and certification: Criteria and checklist. OCLC and CRL.

[13] Ross, S., & McHugh, A. 2006. The role of evidence in establishing trust in repositories. *D-Lib Magazine* 12(7/8).

[14] Stewart, D. W., and Shamdasani, P. N. 1990. Focus groups: Theory and Practice. Applied Social Research Methods Series; v. 20. Newbury Park, Calif.: Sage.

[15] St. Jean, B., Rieh, S. Y., Yakel, E., and Markey, K. 2011. Unheard voices: Institutional repository end-users. *College & Research Libraries* 72(1), 21-42.

[16] Van House, N., Butler, M. H., and Schiff, L. R. 1998. Cooperative Knowledge Work and Practices of Trust: Sharing Environmental Planning Data Sets. *Proceedings of the 1998 ACM Conference on Computer Supported Cooperative Work* (Seattle, Washington, USA). CSCW'98.

[17] Yakel, E., Faniel, I., Kriesberg, A., and Yoon, A. Forthcoming. Trust in Digital Repositories. *International Journal of Digital Curation*.