Understanding "Authenticity" in Records and Information Management: Analyzing Practitioner Constructs

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A b s t r a c t

As part of ongoing research, this paper explores how practitioners in records and information management currently understand the construct of authenticity in their professional activities, by examining the concepts and language that they actually use when talking about authenticity. This paper provides brief descriptive statistics drawn from an Internet listserv survey conducted in May 1998, and then analysis related to proving authenticity; the difficulties of judging something authentic; and definitions of authenticity as used and understood in the context of respondents' professional activity. The analysis provides indications of how professionals actually understand and use the concept of authenticity in their professional work depending on the context; and how these professionals react differently to paper records and electronic records. The paper concludes with a discussion of how this preliminary analysis fits within the context of the outcomes of prior electronic records research.

I n t r o d u c t i o n

In recent years the rapid spread of electronic records and communication systems has presented significant changes and challenges to many disciplines.[1] The increasing growth of computer communications has made new opportunities possible and raised subsequent issues such as data security, accountability, reliability, authenticity, privacy, authentication, and encryption.

[1] For the purposes of this paper, electronic records are defined as records created, received, and maintained in electronic form by individuals or agencies in the course of conducting business . Lewis J. Bellardo and Lynn Lady Bellardo, *A Glossary for Archivists, Manuscript Curators, and Records Managers* (Chicago: Society of American Archivists, 1992).

Accordingly, a variety of perspectives in understanding and implementing a new medium bring different approaches with different angles to addressing common problems. For example, the archival community has emphasized the description, identification, and preservation of digital materials through the evidence-based approach to the management of records.[2] The legal community has considered the validity of electronic documents as evidence in terms of the reliability of the processes associated with their creation and security of records during data transmission and interchange. Indeed, there is a wealth of case law on this topic and new legislation at state and federal levels in response to issues related to the law of electronic commerce.[3] At the same time, computer science has developed technological techniques for security and accuracy protection against fraudulent transmission by establishing the validity and identity of a transmission and authorizing access management.[4] More broadly, preserving the immutable and transient value of digital documents is important to theorists concerned with central societal practices.[5]

Archival science derives its construction of authenticity through the management of aggregates of records with reference to their functional, procedural, and documentary contexts from the principles of diplomatics. Diplomatics, a parent discipline to archival science and legal theory that was developed to authenticate medieval documents, examines the genesis and form of individual documents. The diplomatic understanding of authenticity is that a document is authentic when it is what it claims to be.[6] When a record follows the body of rules established for recording acts and also contains all the elements required by the socio-juridical system in which it exists (i.e., it is complete), the record is assumed to be reliable.[7] Reliability is another important concept that, along with

[2] See, for example, Anne J Gilliland-Swetland, *Enduring Paradigms, New Opportunities: The Value of the Archival Perspective in the Digital Environment* (Washington, D.C.: Council on Library and Information Resources, 2000); Heather McNeil, "Metadata Strategies and Archival Description," *Archivaria* 39 (1996): 22–32.

[3] See, for example, Benjamin Wright, *The Law of Electronic Commerce: EDI, E-mail, and Internet : Technology, Proof, and Liability* (Boston: Little, Brown & Company, 1995); Benjamin Wright and Jane Winn, *The Law of Electronic Commerce* (New York: Aspen Law & Business, 1998).

[4] See, for example, Clifford Lynch, *A White Paper on Authentication and Access Management Issues in Cross-organizational Use of Networked Information Resources,* available at <http://www.cni.org/projects/authentication/authentication-wp.html>, November 05, 2001; David Millman, *Cross-Organizational Access Management: A Digital Library Authentication and Authorization Architecture,* available at <http://www.dlib.org/dlib/november99/millman/11millman.html>, November 5, 2001; Ravi Sandhu and Pierangela Samarati, "Authentication, Access Control, and Audit," *ACM Computing Surveys* 28,(March 1996): 241–43.

[5] See, for example, John Seely Brown and Paul Duguid, *The Social Life of Information* (Boston: Harvard Business School Press, 2000); Etienne Wenger, *Communities of Practice: Learning, Meaning, and Identity* (Cambridge: Cambridge University Press, 1998).

[6] Luciana Duranti, "Reliability and Authenticity: The Concepts and Their Implications," *Archivaria* 39 (Spring 1995): 5–10.

[7] Duranti, "Reliability and Authenticity" 6.

authenticity in diplomatics, indicates the trustworthiness and authority of the content of the record. When a record is what it purports to be, the record is genuine. Based on these definitions of authenticity and reliability, the University of British Columbia (UBC) Project on *Preservation of the Integrity of Electronic Records* conceptually identified and defined the requirements for ensuring the integrity of reliable and authentic electronic records, developing these requirements into templates to examine the intrinsic and extrinsic features of the record in electronic environments.[8] Applying the UBC requirements, the U.S. Department of Defense's *Records Management Task Force Project*[9] proposed a comprehensive set of *Electronic Record Management Task Requirements* (1994–1996) for certifying Records Management Applications, which were subsequently incorporated into a Department of Defense standard (DoD 5015.2-STD). Building on the previous UBC Project, the ongoing *International Project* on *Preservation of Authentic Records in Electronic Systems* (InterPARES) tries to identify the elements of electronic records which must be maintained in order to preserve authentic electronic records over time and to develop the procedures and resources, strategies and standards necessary to preserve authentic electronic records.[10] The primary contributions of both of these deductive research projects are the analytical and systematic methods to measure authenticity based on an analysis of features of records and their genesis. The InterPARES project currently underway is extending and testing the templates derived from the UBC project, with case studies being conducted with a variety of institutions in North America, Europe, Asia, and Australia.

By contrast, the University of Pittsburgh Project on *Functional Requirements for Evidence in Recordkeeping,* which includes requirements that records must be authentic, complete, and credible, took an inductive approach, deriving its data by an examination of practices and settings and then developing a generalized set of requirements.[11] The project applied the concept of "literary warrant" to

[8] The University of British Columbia, *The Preservation of the Integrity of Electronic Records Project,* available from http://www.interpares.org/UBCProject/index.htm, November 5, 2001; Heather MacNeil, "Protecting Electronic Evidence: A Final Progress Report on a Research Study and Its Methodology," *Archivi & Computer* 7 (1997): 22–35; Luciana Duranti and Heather MacNeil, "The Protection of the Integrity of Electronic Records: An Overview of the UBC-MAS Research, " *Archivaria* 42 (Fall 1996): 46–67.

[9] U.S. Department of Defense, *Records Management Task Force project proposed Electronic Record Management Test Requirements Project,* available at <http://jitc.fhu.disa.mil/recmgt>, November 5, 2001; Kenneth Thibodeau and Daryll R. Prescott, "Reengineering Records Management: The U.S. Department of Defense, Records Management Task Force," *Archivi & Computer* 6, no. 1 (1996): 71–78.

[10] For further information on the project, visit the web site at <http://www.interpares.org>, November 4, 2001.

[11] The University of Pittsburgh, *Functional Requirements for Evidence in Recordkeeping,* available at <http://www.sis.pitt.edu/~nhprc/>, November 5, 2001; David Bearman, "Archival Data Management to Achieve Organizational Accountability for Electronic Records," *Archives and Manuscripts* 21, no. 1 (1993): 14–28; and Richard J. Cox, "Re-Discovering the Archival Mission: The Recordkeeping Functional Requirements Project at the University of Pittsburgh, A Progress Report," *Archives and Museum Informatics* 8, no. 4 (1994): 279–300; Richard J. Cox, "The Record in the Information Age: A Progress Report on Reflection and Research," *Records & Retrieval Report* 12 (January 1996): 1–16.

develop a set of recordkeeping functional requirements and production rules that would meet accepted societal mandates for evidence in electronic record-keeping.[12] "Literary warrant" can be compiled from legal requirements, standards and professional practices accepted by the various recordkeeping fields, including lawyers, auditors, records managers, information technologists, managers, and medical professionals concerning records and recordkeeping. Applying and evaluating the Pittsburgh functional requirements and metadata specifications, Indiana University's *Electronic Records Project* (1995–1997) examined Indiana University's information systems and found that records exist within the structure and context of information systems as the consequence of a business event, but not as discrete physical objects.[13] By changing the focus of their records appraisal from content to context, the project developed a set of recommendations designed to improve the performance of information systems as recordkeeping systems.

But a limitation of both of the above projects is that they have been largely theoretically based, and the models they have developed to date have only been applied in a limited number of real-world settings. The Consortium of University Research Libraries' *Exemplars in Digital Archives (CEDARS) Project* is working more closely with repositories and uses of digital preservation.[14] The project focuses on digital preservation and aims to address strategic, methodological, and practical issues concerning digital preservation. It defines the authenticity of a document as "the same as that which a user expected based on a prior reference."[15] Authenticity in this case is closely related to demonstrating the integrity of documents, that is, ensuring that they are complete and unaltered from the time of creation. Cornell University's *Project PRISM,* which stands for preservation, reliability, interoperability, security, and metadata, is concerned with issues of information integrity within digital libraries.[16] The project started in 1999 and focuses on enforcing a wide range of security and preservation

[12] Wendy Duff, "Harnessing the Power of Warrant," *American Archivists* 61 (Spring 1998): 88–105.

[13] Indiana University Electronic Records Project (1995–1997), <http://www.indiana.edu/~libarche>, November 5, 2001; Bantin, Philip C., "Developing a Strategy for Managing Electronic Records—The Findings of the Indiana University Electronic Records Project" *American Archivist* 61 (Fall 1998): 328–64; Bantin, Philip C., "The Indiana University Electronic Records Project Revisited" *American Archivist* 62 (Spring 1999): 153–63; Bantin, P. and George Bernbom, "The Indiana University Electronic Records Project: Analyzing Functions, Identifying Transactions, and Evaluating Recordkeeping Systems—A Report on Methodology." *Archives and Museum Informatics* 10 no.3 (1996): 246–66.

[14] Consortium of University Research Libraries (CURL), *The Cedars Project: CURL Exemplars in Digital Archives,* available at <http://www.leeds.ac.uk/cedars>, November 5, 2001.

[15] Consortium of University Research Libraries, *The CEDARS Glossary of Commonly Used Terms (1999),* available at <http://www.leeds.ac.uk/cedars/documents/PSW01.htm>, November 5, 2001.

[16] Digital Libraries Initiative, *Project PRISM,* <http://www.prism.cornell.edu/main.htm>, November 5, 2001, March 10, 2001; See Herbert Van de Sompel, and Carl Lagoze, The Santa Fe Convention of the Open Archives Initiative, *D-Lib Magazine,* 6 (February 2000) available at <http://www.dlib.org/dlibqq/february00/vandesompel-oai/02vandesompel-oai.html> November 5, 2001; Carl Lagoze and Anne Kenney, "The Prism Project: Vision and Focus," January 2000, <http://www.prism.cornell.edu/Publications/WorkingPapers/Visions.htm>, November 5, 2001.

policies to protect valuable resources in a globally distributed digital library environment. In the context of this research, reliability refers to the predictable availability of information resources and services. The Australian Records Continuum model is another approach to the management of records that integrates all aspects of recordkeeping, including design of a recordkeeping system and the ongoing use of records.[17] The authenticity of records is assumed by means of delineating business processes that generate records, designing and building recordkeeping systems, and managing records to meet current business and ongoing research needs.

None of the projects mentioned above, however, has specifically examined the extent to which actual creators, users and managers of records are able to understand project outcomes and definitions nor do they examine the extent to which these outcomes and definitions map onto how practitioners construct discourse-based or rhetoric-based concepts such as authenticity (i.e., the actual language they use to express concepts relating to authenticity in recordkeeping and information management such as those that are derived from legal, diplomatic, archival principles, or computer science such as "reliability," "integrity," "warrant," and "evidence").[18]

The ongoing research on which this paper reports examines how authenticity is understood in practice among end-users: first, by examining practitioners' own terminology and notions related to authenticity; and second, based on this examination, by aiming to build a framework that will assist in mapping the correspondences between the theoretical concepts of research and the actual language and constructs of practitioners and users. Specifically, this research examines practitioners' conceptualizations and usage of the concept of authenticity in order to: 1) identify characteristics of terms used by records practitioners and users in defining the concept of authenticity in the management of electronic records in different organizational contexts; 2) develop the characteristics into a model that can assist records practitioners and users to think about authenticity in different organizational contexts; and 3) use this model as a means of mapping between the language and findings of theoretical research projects and the language of practitioners and users.

This paper specifically reports the result of a pilot study for this research focusing on practitioners' understanding of the concept of authenticity as derived from a small set of survey data. The survey was undertaken to examine

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[17] Records and Recordkeeping: The Records Continuum. *Government Recordkeeping Manual.* Available at <http://rcrg.dstc.edu.au/index.html>, November 5, 2001. See Sue McKemmish, Glenda Acland, Nigel Ward and Barbara Reed. "Describing Records in Context in the Continuum: The Australian Recordkeeping Metadata Schema," *Archivaria* 48 (Fall 1999): 3–43.

[18] For an attempt to understand how practitioners and professionals view the concepts of authenticity and reliability in records, see J. Van Maanen and Brian T. Pentland, "Cops and Auditors: the Rhetoric of Records," in Sim B. Sitkin, and Robert J. Bies eds., *The Legalistic Organization* (Thousand Oaks Calif.: Sage, 1994): 53–90. Their article reports case study of financial auditing work and mention how auditors determine the authenticity and reliability of records in their own work from the auditor's perspective.

how different communities use and understand the concept of authenticity in creating, managing, and using records. This project examined how practitioners of records and information management currently consider issues related to authenticity in their professional activities, as they use and transmit active paper records and electronic records. It also examines the language they actually use when talking about authenticity.

Methodology

The researcher conducted a brief exploratory survey in May 1998. The survey asked respondents if they had considered issues of authenticity in their work processes. A questionnaire (see Appendix 1) was posted and distributed on the Internet to eight listserv groups selected because of the likelihood that their membership might be involved in a range of capacities relating to the management of paper and electronic records or digital information. The listservs selected were the Archival Cataloging Listserv, Archives and Archivists Listserv, Conservation DistList, Association for Moving Image Archivists, Electronic Records Listserv, Digital Libraries Research mailing list, Rare Books and Special Collections, and Records Management Listserv. Respondentswere predominantly records managers/archivists and librarians.[19] One hundred and four responses to the questionnaire were received, consisting of 42 from records managers/archivists, 30 from librarians, 6 from system analysts/programmers, 5 from administrators, 4 from information managers, 2 from attorneys, and 15 from other fields. Although Internet surveying is a method generally considered to yield data with low validity because it is harder to identify response rates and respondents than with mail surveys, the method was consciously chosen in this case in order to identify persons who are highly interested in the issue or might have already contemplated issues related to the authenticity of records they manage. By identifying a preliminary group of persons within a population that the researcher wanted to survey in depth, it provided data to assist in the development of a model and instruments for further data collection and analysis as part of the larger research in process.

Coding and Data Analysis

The emphasis of this pilot study is on the content analysis of the words used in response to the survey. The survey asked respondents about their background,

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[19] Since respondents were drawn from those who use the Web, belong to listservs, and respond actively and randomly to list questionnaires and surveys, they may not represent a whole group of practitioners but those for whom such on-line resources are physically or intellectually accessible. Records Managers/ Archivists and Librarians are grouped as one category in this paper because of overlap in their categorization. The "others" category includes 3 conservators, 3 consultants, 3 historians/anthropologists, 2 marketing managers, 1 project manager, 1 film producer, 1 CEO, and 1 office secretary.

their experience with electronic records and communications, their experience and opinions regarding the authenticity of paper records, the authenticity of electronic records, and their preferred records format. This paper provides brief descriptive statistics on the survey data and then focuses on the three central topics: first, the problem of proving authenticity; second, the difficulties of judging something authentic; finally, the definition of authenticity itself as used and understood in the context of the professional activity of the respondents.

Several answers were thematically coded. Coding reliability for the complex categories was checked by using a second coder. Questions 7, 8, 11, and 12 were binary (yes/no) questions, and so were analyzed quantitatively. Questions 9, 10, 13, 14, and 16 were coded by theme because they were open-ended questions that asked respondents to write down their own thoughts. The survey questionnaire used questions in a parallel form to compare the difference between paper records and electronic records. Two sets of questions, 7 and 11, and 8 and 12, were, therefore, analyzed together. Questions 9 and 13, and 10 and 14 were also parallel sets of questions and were, therefore, analyzed using the same thematic categories.

Findings and Discussion

The results presented in Figure 1 provide simple descriptive statistics.

In Figure 1, 79 respondents (76%) indicated that they have considered issues related to the authenticity of paper records, and 83 respondents (80%) indicated that they have considered issues related to the authenticity of electronic records.

The results of questions 8 and 12 are provided in Figure 2.

As seen in Figure 2, only 46 persons working with paper records (44.23%), and 33 persons working with electronic records (31.73%), have been in situations necessitating the demonstration of authenticity of records. In other words, while most respondents have considered issues of authenticity, far fewer have ever actually needed to prove the authenticity of records.

Eight main themes emerged from the responses to the next set of parallel questions about paper records and electronic records ("Can you describe the situation where you have needed to prove that the authenticity of paper/electronic records is important?"): "Supporting litigation," "Proving/verifying," "Authenticating/validating," "Preserving/digitizing," "Controlling the version;" "Ensuring accuracy," "Ensuring quality," and "Meeting contractual obligations" (See Figure 3 for descriptions).

Table 1 shows the results of two questions with frequencies and percentages.

It is noteworthy that, for both paper and electronic records, more than half of the respondents indicate two themes, "supporting litigation" and "authenticating/validating." Combined percentages of these two themes equal 54.16%
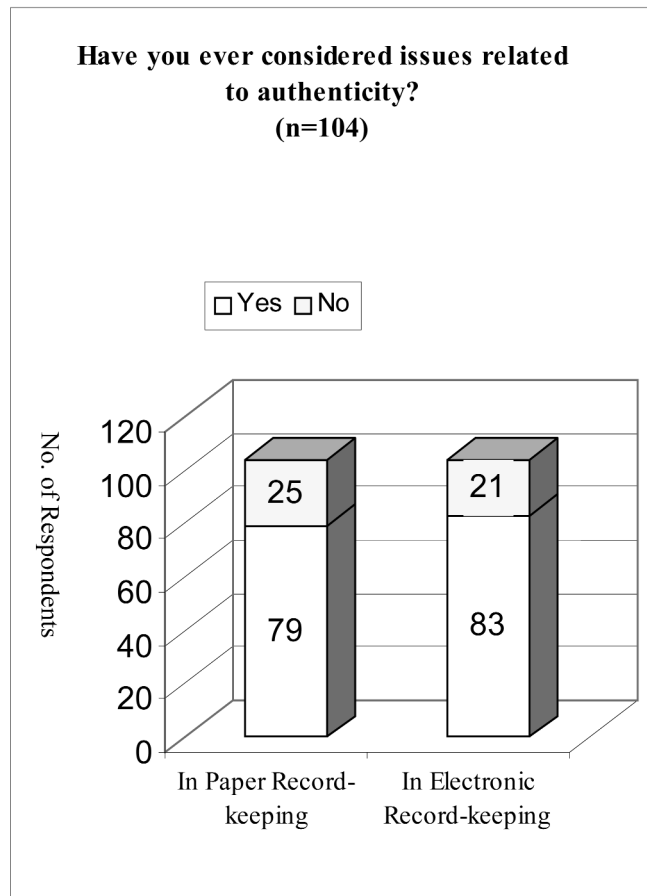
Have you ever considered issues related to authenticity?
(n=104)

□Yes □No

No. of Respondents

	In Paper Record-keeping	In Electronic Record-keeping
No	25	21
Yes	79	83

FIGURE 1. Consideration of Authenticity

and 51.43%, respectively. Moreover, the overall proportions of each answer are similar for both forms of records, indicating that the major situations where practitioners feel it necessary to prove authenticity are likely to be the same for both paper, and electronic records. In considering the differences between the two forms of records, it is notable that with paper records, practitioners tend to demonstrate authenticity for "supporting litigation" more than routine "authenticating/validating," probably because they have had more experiences with paper records in litigation. With electronic records, practitioners appear to be concerned with routine "authenticating/validating." Another interesting observation is that, in the case of electronic records, "ensuring accuracy" ranks
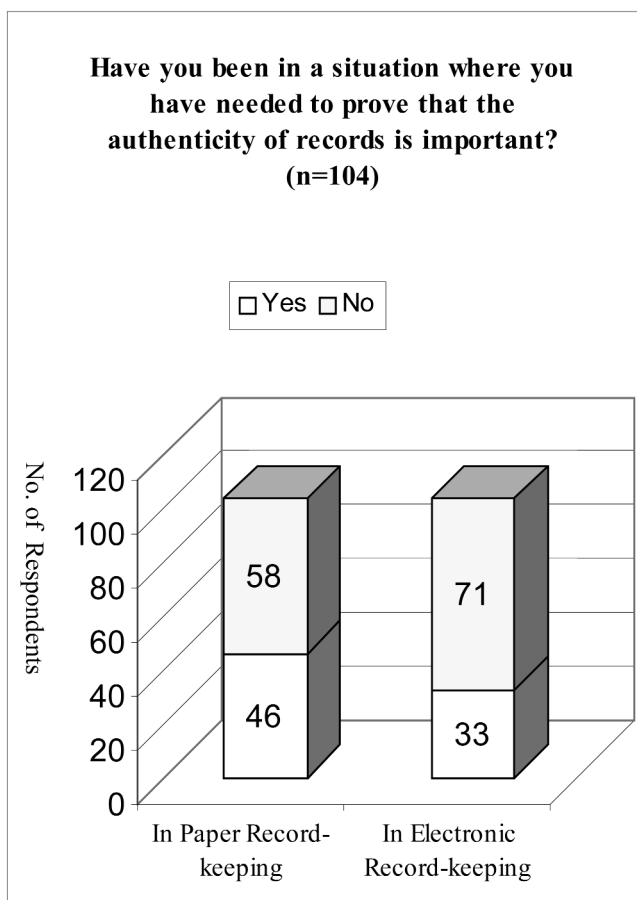
Have you been in a situation where you have needed to prove that the authenticity of records is important? (n=104)

□ Yes □ No

No. of Respondents

58	71
46	33

In Paper Record-keeping   In Electronic Record-keeping

F I G U R E 2 .   Need to Prove Authenticity

as the third highest percentage, but in the case of paper records, it ranks only seventh among the eight themes. This probably reflects a concern that electronic records are more prone to accidental or deliberate damage and can be changed and altered more easily than paper records.

Another interesting observation is that to prove authenticity with electronic records, respondents indicated that other sources are required to verify "accuracy" because electronic records are not self-explanatory or self-validating. For example, one respondent stated that "we rely on the accuracy of catalog records contributed by librarians who are members of our bibliographic utilities (OCLC, RLIN), as well as on records found on the Internet in many other

FIGURE 3.   Descriptions of Emergent Themes Relating to Proving Authenticity

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Theme: Descriptions

Supporting litigation: Authenticity is needed for supporting litigation, lawsuits, court cases, or other legal and judicial actions in court.
e.g., "Authentication of records is necessary to introduce any document or record into evidence at a trial or motion. We were asked to do so during a trial recently."

Proving/verifying: Authenticity is needed for proving or verifying.
e.g., "The situation was to prove that I was not the person who posted a scurrilous message to an Internet discussion group . . ."

Authenticating/validating: Authenticity is needed for authenticating or validating that records are not fake or counterfeit.
e.g., "Establishing the authenticity of records is vital in my business since most of the valuable records have been counterfeited."

Preserving/digitizing: Authenticity is needed for converting or digitizing data into different formats.
e.g., "We are currently faced with the issue of reformatting electronic media such as videotapes. Deciding on the conversion of cancelled check records from paper to microform."

Controlling the version: Authenticity is needed for deciding between the original version or a copy, or differentiating between multiple copies in a situation where there are more than two different versions.
e.g., "Some times there are 6 copies of the same letter. Of course each is corrected and changed from the earlier on. Then the last is the actual authentic letter which is so after editing and was the one sent to the person or prospect. This is the authentic [one] and sometimes requires time in figuring out which is the real finished one."

Ensuring accuracy: Authenticity is needed for ensuring accuracy or correctness.
e.g., "It is necessary to make sure that what is filed is the most accurate and up to date information possible. . . . I have found that often times the system people require the paper files to ensure the data entered into computer is accurate."

Ensuring quality: Authenticity is needed for ensuring quality control.
e.g., "Required to document the authenticity of records gathered for quality of products and services."

Meeting contractual obligations: Authenticity is needed for meeting contracts or contractual compliance.
e.g., "Contract in hand was the original, official copy."

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on-line library catalogs throughout the world. If the item to be cataloged does not match exactly the records we find, we need to determine whether the electronic catalog records are accurate." Electronic records that are authentic need to be accurate, and then, to be considered accurate, they need to be corroborated by other authoritative sources. With paper records, however, respondents answered passively or seemed to believe implicitly in the accuracy of the records. For example, one respondent stated, "binding records, which I work with every day, have to be accurate."

One weakness of these results is the relatively low number of respondents answering these questions. Only 47 and 38 persons, respectively, out of the total of 104 survey respondents, answered these questions. It is possible that the low

Table 1   Emergent Themes Relating to Proving Authenticity

Theme	Paper Records		Electronic Records	
	Frequency	Percent (%)	Frequency	Percent (%)
1. Supporting litigation	16	33.33	7	20.00
2. Proving/verifying	4	8.33	3	8.57
3. Authenticating/validating	10	20.83	11	31.43
4. Preserving/digitizing	4	8.33	3	8.57
5. Controlling the version	5	10.42	3	8.57
6. Ensuring accuracy	3	6.25	6	17.14
7. Ensuring quality	2	4.17	1	2.86
8. Meeting contractual obligations	4	8.34	1	2.86
TOTAL (n)	47	100%	36	100%

response to these particular questions might be due to the difficulty of the questions or to the respondents' relative lack of experience with situations where they have needed to demonstrate authenticity.

Eight main themes emerged from the responses to the next parallel questions concerning paper records and electronic records ("How do you judge whether a paper/electronic record is authentic?"): "signature," "authentication symbols," "adherence to information management policy," "guidelines, and procedures," "authority of source," "physical condition," "comparison with other sources," "unalterability/unchangability," and no criteria." (See Figure 4 for descriptions).

Table 2 presents the results of two questions with frequencies and percentages.

For paper records, 52% of the respondents indicated that "signature" and "authentication symbols" are useful in determining the authenticity of records, e.g.,, a signature, letterhead markings, official form, handwriting, date, and location. For electronic records, 46% cited "authentication symbols" and "authority of source." "Authority of source" is highly rated for both formats. For electronic records, "signature" is rated relatively lower than that of paper records, but "comparison with other sources" and "no criteria," are considerably higher. For example, one respondent writes, "I am in the GIS industry and the only way to get 'true' information is to ground truth in some cases" because "the electronic record is checked against the item in hand; access points are checked against national authority databases." Another respondent notes the we need to "compare it to source material or parallel records and other known facts." For paper records, respondents weighed physical aspects more heavily than they did for electronic records. Respondents listed such aspects as quality of paper, age of paper, type of paper, smell, color, use of photographic and xerographic details, physical location, spelling, format check, nature of ink, contents of document, context of creation, feel, and experience. While only one respondent answered "no criteria" regarding paper records, eleven respondents gave this answer regarding electronic records. For example, respondents

FIGURE 4.   Descriptions of Emergent Themes Relating to Judging Authenticity

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Theme: Descriptions

Signature: Respondents judge if a record is authentic by seeing any forms of signature, including hand-written signature and digital signature.

Authentication symbols: Respondents judge if a record is authentic by seeing any forms of authentication symbols including seals, certification, watermarks, letterhead, date, mailing, e-mail, and all kinds of metadata, except signature*.

Adherence to information management policy, guidelines, and procedures: Respondents judge if a record is authentic by referring to policy or guidelines, or to a procedure manual, etc. within the organization.
e.g., "Yes, by providing the written policy and procedures showing a standard method of creating the record. . . ."

Authority of source: Respondents judge if a record is authentic by referring to the authority and originality of the source of information.
e.g., "what it is; where it came from; what its content is. . . ."

Physical condition: Respondents judge if a record is authentic by referring to physical conditions and characteristics such as age of paper, printing condition, physical appearances, etc.

Comparison with other sources: Respondents judge if a record is authentic by comparing the original with copies or other sources.
e.g., "verify it in more than one source"

Unalterability/unchangability: Respondents judge if a record is authentic by seeing that no changes have been made in the item.
e.g., "determination of originality of item, mainly checking for illegal photocopies. Is this an original or a copy?"

No criteria: Respondents are unable to judge if a record is authentic because there are no established criteria yet.
e.g., "No organized criteria . . . No way to do that."

* There is considerable ambiguity in the overlap between "signature (esp. digital signature)" and "authentication symbols (esp. seals)," probably because a digital signature exhibits the characteristics of both a signature and a seal. They are broken into two categories here because there is a high incidence of the term "signature" in the survey responses.

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said: "There is really no good way at present beyond the address on the email;" "In the environment in which I work it would be impossible to authenticate some electronic records; word-processing documents in particular would be a problem;" and "I would like to know how if there is. I tend not to trust them, because one is not able to look into the persons [sic] face." Such responses imply that determination of authenticity in the realm of electronic records still seems difficult in the working environment.

Seven major themes emerged from the third question ("Please write down how you would define authenticity in the context of your professional activity."): "authority of source," "accuracy assurance," "originality/genuineness," "quality assurance," "unalterability/unchangability," "validity/reliability," and "Verification." (See Figure 5 for descriptions.)

Table 2   Emergent Themes Relating to Judging Authenticity

Theme	Paper Records		Electronic Records	
	Frequency	Percent (%)	Frequency	Percent (%)
1. Signature	27	25.96	7	7.37
2. Authentication symbols	27	25.96	23	24.21
3. Adherence to information management policy, guidelines, and procedures.	9	8.65	12	12.63
4. Authority of source	17	16. 35	21	22.11
5. Physical condition	16	15.38	1	1.05
6. Comparison with other sources	4	3.86	11	11.58
7. Unalterability/unchangability	3	2.88	9	9.47
8. No criteria	1	0.96	11	11.58
TOTAL (n)	104	100%	95	100%

F I G U R E   5 .   Descriptions of Emergent Themes Relating to Defining Authenticity

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Theme: Descriptions

Authority of source: Authenticity is associated with authoritativeness of source and context.
e.g., "I define authenticity as being able to be certain that records have been created by the person they say they are, when they say they are containing true (or perceived to be true) information as related to their context."

Accuracy assurance: Authenticity is associated with assuring accuracy or correctness.
e.g., "Maintain written standards of process which are followed without deviation. The standards should follow industry guidelines (if such exist)."

Originality/genuineness: Authenticity is to be original and genuine.
e.g., "It is the original record created (and copies) at the time of the activity (whatever it may be) and presented as being the facts, conditions, purpose, truth, etc."

Quality assurance: Authenticity is associated with assuring quality.
e.g., "I work with a large construction company developing its own document control database which I have used for 3 years; I believe that because we get the paper document within a brief amount of time after it is logged in to the database that lends to the authenticity of those records."

Unalterability/unchangability: Authenticity is associated with ensuring that no changes are made to the item.
e.g., "Any data object in which not a single bit of the binary content has been modified. . . ."

Validity/reliability: Authenticity is to be valid or reliable.
e.g., "When a document is what it claims to be and is from whom it says it is. Authenticity goes hand in hand with reliability. . . ."

Verification*: Authenticity is to be verified or proved.
e.g., "An authentic document or record is one which is intrinsically able to be proved that it is what it purports to be."

* Two themes, "authority of source" and "validity/reliability," are closely related in their mean-ing. In this survey, "validity/reliability" was coded only when those words were used in responses.

Table 3 presents the result of the question with frequencies and percentages.

Table 4 shows the comparison of records managers/archivists and librarians concerning the concept of authenticity with frequencies and percentages.

As with the previous cases in Table 3, the first two themes, "authority of source" and "accuracy assurance," cover two-thirds of the answers (68.93%) relating to the definition of authenticity, while "originality/genuineness" ranks third. The total percentage of the top three themes amounts to 81.46%. For "authority of source," one respondent answered, "authenticity—it is a matter of trust; you either trust the organizations you do business with (and they, in turn, trust their employees to be ethical in their work practices) or you don't. Whether they send you a signed, sealed copy of a paper document, or you get an e-mail with their smtp address, you trust that the person whose signature appears at the bottom is the one who signed it, or the person whose smtp address appears is the one who was sitting at the other end of the transmission."

Respondents from professional groups answered differently depending on the context. One records manager answered, "Authenticity with regards to my profession means information (because we are information center-specialists) is

Table 3 Emergent Themes Relating to Defining Authenticity

	Records	
Theme	Frequency	Percent (%)
1. Authority of source	33	37.93
2. Accuracy assurance	27	31.03
3. Originality/genuineness	11	12.64
4. Quality assurance	2	2.30
5. Unalterability/unchangability	8	9.20
6. Validity/reliability	2	2.30
7. Verification	4	4.60
TOTAL (n)	87	100%

Table 4 Comparison of Records Managers/Archivists and Librarians Relating to Defining Authenticity

	Records Managers Archivists		Librarians	
Theme	Frequency	Percent (%)	Frequency	Percent (%)
1. Authority of source	16	42.11	9	32.14
2. Accuracy assurance	7	18.42	13	46.43
3. Originality/genuineness	6	15.79	1	3.57
4. Quality assurance	2	5.26	0	0
5. Unalterability/unchangability	3	7.89	3	10.72
6. Validity/reliability	1	2.64	1	3.57
7. Verification	3	7.89	1	3.57
TOTAL (n)	38	100%	28	100%

from a reputable source, one can verify if needed. Also the source is important." A librarian answered, "Authenticity would simply mean obtaining the proper/accurate information from a reliable source for patron use in formulating opinions/theses. I would say a document is authentic if it is clearly identified in terms of title, author, and data" While records managers listed as "authority of source," the person (creator, user), authorizing organizations, signature, and originating source, librarians tended to list title, author, date, and users. Respondents also used different terminology in defining the same concept depending on the profession with which they identified. Records managers tend to deal with records as artifacts of the work process and, as a result, view the concept of authenticity as it relates to processes of business and records management. Librarians primarily manage published materials and view authenticity in terms of providing their users with information from a reliable source. For example, regarding the theme "accuracy assurance," librarians focused on the accuracy of bibliographic records which would be used for users, while records managers looked at records from the perspective of determining whether they conform to established business and records management standards.

To analyze respondents' definitions of authenticity in further depth, respondents' actual language in question 16 was analyzed by word frequency. The total number of words used by respondents was 3,323; after 1,671 occurrences of 155 stop word forms were excluded, the number of unique word forms was 951, and the total number of unique words was 1,652. Words were then clustered morphologically by word-stems and ordered by frequency. Table 5 lists the top thirty-nine word-stems. These comprised 16.33% of the total number of words and 32.90% of the total number of unique words, after the exclusion of stop words. The top two word-stems are *record** (e.g.,, records, recording) and *authent** (e.g.,, authenticity, authenticate), which is not unexpected considering that these two word-stems were present in the language used in the survey question. *Inform** (e.g., information, informing) and *docu** (e.g., document, documenting), word stems that are prevalently used among persons who deal with records, rank third and fourth. *Origin** (e.g., originality, originate), and *accura** (e.g., accuracy, accurate), word-stems that one might anticipate as highly used by records professionals with reference to authenticity, rank sixth and seventh; *verif** (e.g., verification, verify) ranks thirteenth, and *prov** (e.g., provenance, proving, prove) is thirty-sixth. There are also many word-stems related to people such as *person** (e.g., person, personal) *author** (e.g., authority, author) and *agen** (e.g., agent, agency).

Trust* (e.g., trust, trustworthy) and *reliab** (e.g., reliability, reliable), word-stems which would seem directly related to authenticity, occur only five and four times, respectively, and are thus not included in the top thirty percent. *Audit** (e.g., auditability, audit), the word-stem of key functional requirements identified in the Pittsburgh Project, was used only three times. Other word-stems that are used less frequently, but that featured prominently in major pro-

Table 5 Frequency of Morphological Clusters in Defining Authenticity

Total number of words: 3323
Total number of words after the exclusion of stop words: 1652
Unique word: 951

Rank	Stem	Occurrence	Percent (/3323)	Percent (/1652)
1	record*	79	2.38	4.78
2	authent*	34	1.02	2.06
3	inform*	27	0.81	1.63
4	docu*	26	0.78	1.57
5	creat*	23	0.69	1.39
6	origin*	21	0.63	1.27
7	accura*	18	0.54	1.09
8	person*	15	0.45	0.91
8	author*	15	0.45	0.91
10	electron*	14	0.42	0.85
11	truth*	13	0.39	0.79
12	issu*	12	0.36	0.73
12	verif*	12	0.36	0.73
12	paper*	12	0.36	0.73
15	librar*	11	0.33	0.67
15	abilit*	11	0.33	0.67
15	sign*	11	0.33	0.67
15	catalog*	11	0.33	0.67
15	copy*	11	0.33	0.67
20	proce*	10	0.30	0.61
20	standard*	10	0.30	0.61
20	purpos*	10	0.30	0.61
23	dat*	9	0.27	0.54
23	Tim*	9	0.27	0.54
23	source*	9	0.27	0.54
23	mean*	9	0.27	0.54
23	biblio*	9	0.27	0.54
23	us*	9	0.27	0.54
23	work*	9	0.27	0.54
30	act*	8	0.24	0.48
30	matter*	8	0.24	0.48
30	relat*	8	0.24	0.48
30	form*	8	0.24	0.48
30	quest*	8	0.24	0.48
35	agen*	7	0.21	0.42
35	prov*	7	0.21	0.42
35	business*	7	0.21	0.42
35	content*	7	0.21	0.42
35	context*	7	0.21	0.42
	TOTAL	544	16.33%	32.90%

jects such as the UBC Project, are *genuin** (e.g., genuine, genuineness) used twice, *archiv** (e.g., archives, archival), used twice, *certif** (e.g., certification, certify), used twice and *eviden** (e.g., evidence, evidentiary), used once.

To compare different language uses of two professional groups in defining the concept of authenticity, Tables 6 and 7 show the different frequencies of words used by records managers/archivists and librarians.

Table 6 Frequency of Morphological Clusters in Defining Authenticity by Records Manages/Archivists

Total number of words: 1448
Total number of words after the exclusion of stop words: 676
Unique word: 525

Rank	Stem	Occurrence	Percent (/1448)	Percent (/676)
1	record*	38	2.62	5.62
2	docu*	21	1.45	3.11
3	authent*	17	1.17	2.51
4	creat*	15	1.04	2.22
5	person*	11	0.76	1.63
6	sign*	10	0.69	1.48
6	origin*	10	0.69	1.48
8	inform*	8	0.55	1.18
8	prov*	8	0.55	1.18
10	business*	7	0.48	1.04
10	context*	7	0.48	1.04
10	tim*	7	0.48	1.04
10	offic*	7	0.48	1.04
10	proce*	7	0.48	1.04
14	agen*	6	0.41	0.89
14	author*	6	0.41	0.89
14	electron*	6	0.41	0.89
14	paper*	6	0.41	0.89
14	standard*	6	0.41	0.89
19	act*	5	0.35	0.74
19	construct*	5	0.35	0.74
19	manag*	5	0.35	0.74
22	belie*	4	0.28	0.59
22	contain*	4	0.28	0.59
22	copy*	4	0.28	0.59
22	ensur*	4	0.28	0.59
22	issu*	4	0.28	0.59
22	purpos*	4	0.28	0.59
22	system*	4	0.28	0.59
22	trust*	4	0.28	0.59
22	work*	4	0.28	0.59
	TOTAL	254	17.54%	37.00%

To records managers and archivists, the concept of authenticity is closely related to *creat** (e.g., creator, create), *sign** (signature, sign), *origin** (originator, originate), *prov** (proving, prove), *business,** *context,** and *proce**. There are some words used only by this group such as *standard**, *construct**, *agen**, and *ensur**. By contrast, the group of librarians frequently use *accura**, *librar**, *catalog**, *biblio**, *author**, *item**, *patron**, *title**, *number**, and *dat**, which are closely related to bibliographic information. The different language the two groups use to express their concept of authenticity derives from their different professional practices and their different notions about the record. In addition, a glance at these tables confirms that practitioners tend to understand authenticity as a

Table 7   Frequency of Morphological Clusters in Defining Authenticity by Librarians

Total number of words: 1095
Total number of words after the exclusion of stop words: 488
Unique word: 430

Rank	Stem	Occurrence	Percent (/1095)	Percent (/488)
1	record*	25	2.28	5.12
2	authent*	19	1.74	3.90
3	accura*	13	1.19	2.66
4	inform*	12	1.10	2.46
5	librar*	11	1.0	2.25
5	catalog*	11	1.0	2.25
7	biblio*	7	0.64	1.43
7	docu*	7	0.64	1.43
9	us*	6	0.55	1.23
9	author*	6	0.55	1.23
9	messag*	6	0.55	1.23
11	electron*	5	0.46	1.02
11	item*	5	0.46	1.02
11	patron*	5	0.46	1.02
11	title*	5	0.46	1.02
16	truth*	4	0.37	0.82
16	origin*	4	0.37	0.82
16	verif*	4	0.37	0.82
16	issu*	4	0.37	0.82
16	mean*	4	0.37	0.82
16	number*	4	0.37	0.82
16	object*	4	0.37	0.82
16	dat*	4	0.37	0.82
	TOTAL	175	16.04%	35.83%

concept related to accuracy, originality, and verification, rather than to evidence, reliability, genuineness, warrant, integrity, auditability, or other constructs that electronic records research projects consider important.

Summary and Conclusions

This paper reports the results of an exploratory survey designed to probe practitioners' concepts of authenticity in their work activity. While the question of how to create and preserve the authenticity of electronic records has recently been asked in both archival and preservation research, systematic research on how the concept is applied by practitioners and users who work with records, such as records managers and other information professionals, has not been addressed. As a preliminary study for a more extensive research project, this survey has explored the following questions: What does the concept of authenticity mean to practitioners? How do practitioners define the

concept of authenticity? And, is the concept of authenticity understood differently in different professional domains?. Among the preliminary findings are the following:

- Practitioners maintain a high recognition of the concept of authenticity in both paper and electronic records. However, less than half have ever been in a situation where it was necessary to verify authenticity in either format.
- Practitioners have basically the same understanding of authenticity for both paper records and electronic records. However, they understand that ensuring authenticity with electronic records is different from their paper counterparts, because electronic records are more easily altered and unstable, and left unsigned, and they are generated and used in a different manner.
- Major rationales relating to proving authenticity are "supporting litigation" and "authenticating/validating" for both of paper and electronic formats.
- Major indicators for judging authenticity are "authentication symbols" and "authority of source." "Signature" is ranked high only for paper records, "comparison with other sources" for electronic records only.
- Three methods for defining authenticity are "authority of source," "accuracy assurance," and "originality/genuineness" and, therefore, electronic records may require a second validating or corroborating source to verify their authenticity.
- Respondents from professional groups answered differently depending on the context. While records managers and archivists rank "authority of source" the highest, librarians rank "accuracy assurance" the highest.
- Language uses of professional groups in talking about the concept of authenticity differ. Records managers and archivists understand the concept of authenticity as closely related to the origin and procedural context of records. They use word stems such as *creat**, *sign**, *origin**, *prov** , *business**, *context** and *proce**. Librarians frequently use word stems closely related to bibliographic practices including *accura**, *librar**, *catalog**, *biblio**, *author**, *item**, *patron**, *title**, *number**.

Practitioners' understanding and usage of the concept of "authenticity" and associated concepts are closely related to their working practice and the context of their work experience. Records users and practitioners deal with records every day in their work processes, where they judge the authenticity of records as needed. Through those processes, practitioners have come to create and understand a working concept of authenticity in their own minds. Throughout the findings of the survey, some important issues are raised that will be explored further in follow-up research. The language used by practitioners to express issues of authenticity differs significantly from the language used by the most prominent research projects. Even when both groups use

the same language, different meanings are associated with that language. Moreover, different professional groups use different language in defining authenticity, and these differences need to be better understood if research results are going to be effectively translated into practice. Thus it is quite possible that practitioners find it hard to understand the terms and frameworks identified by theoretical research projects. The results of this survey suggest that further research should be focused on how to bridge the gap between research and practice. Further research should be directed toward finding ways to apply other research projects to understanding the language practitioners actually use regarding authenticity. Another area of potential research relates to the comparison and difference between professional groups that often have overlapping responsibilities and jurisdictions with regard to electronic records and information.

This paper provides the preliminary results of analysis of two professional groups based on a relatively small set of data, but an in-depth analysis of different professional communities would yield more insight into the ways in which practitioners use, manage, and understand authenticity. This paper has taken a necessarily circumscribed approach to such comparisons. The results of this survey will be used as the basis for developing further data collection instruments and refining data analysis methods. A second survey will be conducted with more closely identified subjects and will utilize the language, concepts, and approaches identified in the pilot study. By pursuing such real-life studies of authenticity through the use of practitioners in their work places, the author's hope is to provide ways of mapping correspondences between the concepts developed by previous or ongoing projects and the conceptualizations and practices of records practitioners.

Appendix I

Authenticity of Records

This survey is being conducted as part of a doctoral research project that is exploring how different communities create, use, manage, and understand the concept of authenticity in records. This project examines how people currently consider issues related to authenticity in record management and what "authentic" records mean in different communities.

This survey is strictly anonymous and your participation is completely voluntary. IP addresses or any other information about identifying the sources will not be recorded. The results of this survey will be used only for this research project. Please return the survey by May 25, 1998. If you have any questions or comments, please email to Eun Park (eun@ucla.edu).

1. Which of the following describes your profession? (Check all that apply)

[   ] Records manager   [   ] Information resources manager
[   ] Senior administrator   [   ] Attorney
[   ] Systems analyst   [   ] Programmer
[   ] Archivist   [   ] Librarian
[   ] Archives assistant   [   ] Library assistant
[   ] Technical assistant   [   ] Others (Please specify)
_____

2. Which of the following describes your present employer? (Check all that apply)

[   ] Government agency   [   ] Corporation
[   ] Educational institution   [   ] Non-profit organization
[   ] Research institution   [   ] Non-academic cultural institution
[   ] Law firm   [   ] Medical institution
[   ] Utility   [   ] Military
[   ] Financial services   [   ] Others (Please specify)
_____

3. To which of the following electronic listgroups do you belong?

[   ] Archival Cataloging Listserv   [   ] Archives and Archivists Listserv
[   ] Conservation DistList   [   ] Association for Moving Image Archivists
[   ] Electronic Records Listserv   [   ] Digital Libraries Research mailing list
[   ] Rare Books and Special Collections   [   ] Records Management Listserv
[   ] Other professional listgroups

Electronic Records and Communications

4. Have you used any kind of electronic system that creates records? (For example, project management systems, compliance systems, E-mail, personnel management systems, electronic patient records systems, etc.)

[   ] Yes   [   ] No

5. How long have you used such systems?

[   ] Less than 6 months   [   ] 5–7 years
[   ] 6 month–1 year   [   ] 8–10 years
[   ] 1–2 years   [   ] more than 10 years
[   ] 2–5 years

6. What sorts of records do these systems create? (Please specify)

<u>Authenticity of Paper Records</u>

7. Have you ever considered issues related to authenticity in paper records?

[   ] Yes   [   ] No

8. Have you ever been in a situation where you have needed to prove that the authenticity of paper records is important?

[   ] Yes   [   ] No

9. Can you describe the situation? (Please specify)

10. How do you judge whether a paper record is authentic? (Please specify)

<u>Authenticity of Electronic Records</u>

11. Have you ever considered issues related to authenticity in electronic records?

[   ] Yes   [   ] No

12. Have you ever been in a situation where you have needed to prove that the authenticity of electronic records is important?

[   ] Yes   [   ] No

13. Can you describe the situation? (Please specify)

14. How do you judge whether an electronic record is authentic? (Please specify)

<u>Preferred Records Format</u>

15. When you work with records, which format do you trust most and why?

[   ] Paper records   [   ] Electronic records

[   ] Others (Please specify)

Why: (Please specify)

16. Please write down how you would define authenticity in the context of your professional activity

17. May I contact you again for future information?

[   ] Yes   [   ] No

Thank you for your participation. Please return by May 25, 1998 to Eun Park (eun@ucla.edu).