Getting It Done—Collaboration and Development of the Digital Records Conversion Standard

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Abstract

Archivists and records managers have long acknowledged the need to insert recordkeeping requirements and preservation strategies into information system processes. What better place to integrate these requirements than in standards that serve as guidance documents to information management practitioners. The *Digital Records Conversion Process Standard*, ANSI-ARMA 16-2007 (DRCP) assists records professionals with planning, requirements, and procedures to ensure authentic records. This article discusses standards development, the role of and need for records and information management (RIM) standards, challenges inherent in the current process, and the need for a more collaborative approach to standards development. As used in this paper, a *standard* is "a national, international, or industry agreement that establishes qualities of practices in order to achieve common goals."[1]

Introduction

Standards and best practices serve several important functions and are identified as critical resources in the management of digital records. In a time of rapid technological change, standards and best practices provide a common foundation and understanding of concepts and practices as they impact a wide

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[1] Pearce-Moses, Richard, *A Glossary of Archival & Records Terminology* (Chicago: Society of American Archivists, 2005), 369. A *standard* may also be a benchmark or reference used to measure some quality or practice.

variety of information management issues and technologies. Standards play a vital role in ensuring the authenticity, accessibility, and preservation of digital records and information resources. They also provide educational resources for records professionals who need to acquire new knowledge or skill sets. Records programs in both government and private sectors often refer to standards and best practices as authoritative resources in establishing benchmarks and communicating programmatic needs to funding agencies and those with whom they partner to achieve effective records management. Finally, standards and best practices represent current thinking on a topic and provide practical guidance for professionals who may not have expertise or time to develop their own standards and best practices.

Standards development is not widely understood within the records and information management (RIM) community. Records professionals do not participate in great numbers in standards development and for good reason. It is time consuming and labor intensive. Explicit rules and procedures must be followed to develop standards for approval by the American National Standards Institute (ANSI) or the International Standards Organization (ISO). Even for informal professional best practices, some type of consensus building and vetting process is needed to obtain the broadest possible input. Although records professionals appreciate the valuable role of standards in records and information management, few can or are willing to sacrifice the time and resources to participate in a standards development process. The increasing need to collaborate with other information management professions, especially information technology specialists, brings an added dimension to the process and often intensifies the commitment of time and resources to produce a viable standards product.

What is the role of standards and best practices in RIM? If standards are critical to managing electronic records, how can archivists and records managers better participate in the process? Are current standards development processes collaborative in nature? How well does the process bring together the right expertise and technical skills to effectuate a standard that reflects current theory and practice? This article considers the development of the *Digital Records Conversion Process Standard*, ANSI-ARMA 16-2007 (DRCP) in response to these questions.

Background—Why a Standard on Digital Records Conversion?

Electronic records are created in a variety of software packages and storage formats. Digital conversion is one of the processes that records professionals need in their arsenal to meet the challenges of storing, preserving, and providing access to authentic digital records. Digital conversion is a capability that storage repositories

need or they will face the prospect of maintaining a wide variety of software packages and storage formats. It is distinct from migration in that conversion requires 1) the software that was used to create, maintain, and access the electronic records, 2) the software application within which the electronic records are currently embedded, or 3) a target software application.[2] While there is a close relationship between conversion and migration, migration involves proprietary legacy systems that often do not have export functionality. The only way to move electronic records from them is to write a special purpose program or code.[3] Additionally, digital-to-digital conversion is a routine process in information technology operations, so addressing the maintenance of authentic records in the conversion process may directly influence the viability of the record during its active life.

The digital conversion procedures standards project and the ultimate approval of ANSI-ARMA 16-2007 are significant to the discussion of standards development for many reasons.

- A digital records conversion is a fundamental process within IT operations and affects the work of many records professionals: archivists, records managers, information technology specialists, and librarians. Data conversion may be necessary when systems are upgraded or when new technology applications replace old ones. Records professionals must become knowledgeable and conversant with the process if they are to ensure the authenticity of organizational records.
- The project recognized the need for collaboration across several information management professions. As in many aspects of digital records management, varying types of expertise are needed to effectuate workable processes and practices. Because the management of digital records is a collaborative enterprise, the standards development process must be collaborative as well.
- The DRCP project brought to light some of the challenges of standards development in interpreting accepted records and archival concepts in a highly technical area. How do records professionals effectively integrate basic concepts in a technologically based process? This is and will be one of the key challenges to archives and records management in numerous areas of electronic (digital) records management. Whether records professionals are developing their own standards or seeking input into standards produced by related professional fields, they need to be able to communicate effectively and to integrate foundational electronic records management concepts such as authenticity, reliability, accountability, and retrievability in recordkeeping.

[2] Charles Dollar, *Authentic Electronic Records: Strategies for Long Term Access* (Chicago: Cohasset and Associates, 2000), 65–67.

[3] Dollar, *Authentic Electronic Records*, 31.

Literature Review

This literature review focuses on two broad themes: the role and significance of standards and standards development to records professionals in managing digital records and the need for collaboration in the standards development process.

The Role of Standards in Managing Digital Records

Since the early 1990s, records and information management professionals have recognized the importance of and need for standards and standards development in the management of digital records. In 1993, Frederick Stielow stated, "The keys to success for electronic preservation begin to emerge in the form of careful purchases, commonsense procedures, demands for standards, and an understanding of strange acronyms. . . ." He further suggested that archivists must rely on standards and adopt a process view of preservation management to come to grips with technological change. Stielow lamented that archivists became involved in the standards development process only belatedly.[4]

Over a decade later, other records professionals, such as Hans Hofman, wrote about the broad spectrum of standards and their implications for managing electronic records. Hofman urged records professionals to become familiar with standards and their sources, so that they could assist their organizations in selecting which standards to implement. He believed that organizations would use a "mixture of standards" to address a variety of topics including information resource discovery, geo-spatial data, digital preservation, interoperability, and information security.[5]

The International Council on Archives—Committee on Current Records in an Electronic Environment acknowledges that "To implement any strategy one needs a set of tools and methods. In the context of electronic records, this means manuals, model requirements, and standards."[6] The council relied heavily on ISO 15489, Information and Documentation—Records Management, the International Records Management Standard,[7] in the development of its electronic records workbook.

[4] Frederick J. Stielow, "Archival Theory and the Preservation of Electronic Media: Opportunities and Standards Below the Cutting Edge," *American Archivist* 55 (Spring 1992): 332–43.

[5] Hans Hofman, "The Use of Standards and Models," in *Managing Electronic Records,* ed. Julie McLeod and Catherine Hare (London: Facet Publishing, 2005), 18–33.

[6] International Council on Archives—Committee on Current Records in an Electronic Environment, *Electronic Records: A Workbook for Archivists* (Paris: April 2005), 5.

[7] ISO 15489 Information and Documentation—Records Management. ISO 15489-1:2001(E) was developed in response to international consensus to standardize best records management practice. Australian Standard A 4390 was the starting point for ISO 15489. ISO 15489 is available for purchase from ISO or from ARMA International as a PDF download.

International records management research efforts, such as InterPARES, recognize and include standards development as a major component of electronic records management. For example, Domain IV of the InterPARES project focuses on developing a "framework for the formulation of strategies, policies, and standards by examining what principles should guide the formulation of international policies, strategies, and standards related to long-term preservation of authentic electronic records."[8]

Standards also play a vital role in educating records professionals about accepted practice, technology, effective strategies, and theoretical concepts; and archival educators desire to incorporate standards into curriculum content on managing electronic records. Archival educator Margaret Hedstrom sums up the educational value of standards: "With more complex data structures and wider support for data interchange and migration standards within the data processing community, knowledge of information technology standards that support archival functions will be an increasingly essential element of the e-records curriculum."[9] The Society of American Archivists Committee on Automated Records and Techniques acknowledged the importance of standards in educating archivists about technology, and included knowledge about standards in two clusters in its 1993 report: Automated Application and E-records.[10] In 2006, the New Skills for a Digital Era, a colloquium sponsored by the National Archives and Records Administration, the Society of American Archivists, and the Arizona State Library, Archives, and Public Records, identified standards and their development among the themes that extend the knowledge needed by information professionals about the information ecosystem.[11]

The Standards Development Process and Collaboration

It is important for records professionals to understand how standards related to information and records management are developed. On the one hand, the records and information management community agrees that more standards are needed, but on the other, the community often does not have sufficient technological expertise to address all aspects of a given topic. Additionally, standards projects are consensus driven, voluntary efforts difficult to manage without adequate resources.

[8] Luciana Duranti and Kenneth Thibodeau, "The InterPARES International Research Project," *The Information Management Journal* (January 2001): 45.

[9] Margaret Hedstrom, "Teaching Archivists about E-Records and Automated Technology," *American Archivist* 56 (Summer 1993): 430.

[10] Victoria Irons Walch, "Automated Records and Techniques Curriculum Development Project—Final Report," *American Archivist* 56 (Summer 1993): 485–90.

[11] Richard Pearce-Moses and Susan E. Davis, eds., *New Skills for a Digital Era—Colloquium Proceedings*, available at http://www.archivists.org/publications/proceedings, accessed 22 January 2009.

The development of Z39.50 standard,[12] the protocol used by most bibliographic utilities, illustrates several issues encountered in contemporary standards development. The process demonstrated challenges and disagreements similar to those experienced in the DRCP process. ANSI charged the Z39 Subcommittee D (SC D) with developing the protocol and recognized that broader membership was needed to secure all interested parties and provide sufficient expertise, including software developers and vendors who would implement the protocol. International participation in the Z39.50 project, as in the DRCP project, provided additional expertise along with additional communications challenges and varying perspectives on the goal of the project. The SC D work reflected the volatility of technical standards development. Was it feasible or even necessary to create the protocol as a technical standard, or was an agreement on a stable working draft sufficient?[13]

Unlike the Z39.50 initiative, the DRCP project was not developed in anticipation of a particular technology being broadly implemented or adopted. However, it was the first initiative undertaken by the ARMA International Standards Development Committee to focus on a technically based issue. Like the Z39.50 project, the DRCP task force needed broad representation and expertise to address fully the issues associated with digital records conversion. Identifying collaborative partners who could provide the necessary expertise was critical to the ultimate success of the project.

Records creation does not occur in a vacuum, and standards development must recognize the realities of digital record creation and maintenance. Organizational business processes, procedures, and policies spawn records. Standards designed to address digital recordkeeping must reflect the reality that responsibility for digital records may rest with several different groups of professionals and entities within an organization. A collaborative standards development process should bring together the various professions and groups with expertise or experience in standards or best practice work in that particular area. Standards that impact electronic recordkeeping must not only be mindful of technological tools and archival and records management theory, they must also consider the organizational environments in which they likely will be implemented. They must reflect the business processes, the people, and the records—and the relationships among these components.[14]

[12] Z39.50 is a protocol that allows a computer to search collections of information on a remote system, create sets of results for further manipulation, and retrieve information. It is fundamental to most bibliographic utilities.

[13] William E. Moen, "The Development of ANSI/NISO Z39.50: A Case Study of Standards Evolution," PhD diss., Syracuse University, August 1998, 4-1-4-85. This section of the dissertation describes in detail the development of Z39.50.

[14] Hans Hofman, "ISO Records Management Standards," paper presented at the DLM-Forum 2005: Electronic Records Supporting e-Government and Digital Archives, Budapest, Hungary, 6 October 2005.

The literature does not provide much information about how to collaborate to develop standards. Collaborative approaches to standards development may not be widespread, or few people may experience or write about the process. John McDonald writes:

> . . . .The standards and best practices employed by previously distinct disciplines such as publishing and communications (especially via the web), library services, and records management are converging. The need to develop broad, multidisciplinary approaches to metadata models and architectures is simply one of many examples that underline the fact that there are multiple but overlapping frontiers that need to be tamed. Nevertheless, collaboration across the information disciplines has been slow and silo-type approaches to the development of records management standards and practices have continued. These factors can only continue to impede progress in the development of standards and practices that are relevant to the needs of the increasingly complex office environment.[15]

The development of the OAIS Model (the Open Archival Information System, ISO 14721) also illustrates a collaborative standards development process. Before the development of OAIS, a number of organizations and players developed various guidelines and models for digital preservation, but the OAIS initiative brought together what Cal Lee refers to as "streams of activity." Scientists, archivists, librarians, museum curators, and others were driven by common interests in and concerns for digital preservation and long-term access to significant sets of research data.[16] As these groups came together, they created a sense of buy-in to the completed product. Though not initially identified as such, OAIS is considered to be an example of a successful collaborative standards development initiative.[17]

Finally, as Cal Lee notes in discussing the development of the OAIS standard, "Standards development is both a technical and a social process." The actors in the standards development process participate for a variety of reasons. They may want to gain insight into a new process or technology, participate at the direction of others, react to their own personal curiosity, or simply hope to get a copy of the final standard.[18] And, while those involved in standards development might like to encourage collaboration in the formation of task forces and committees, individuals might wish to become involved in the process as well. The trick to

[15] John McDonald, "The Wild Frontier Ten Years On," in *Managing Electronic Records,* 1–15.

[16] Christopher R. Lee, "Defining Digital Preservation Work: A Case Study of the Development of the Reference Model for an Open Archival Information Systems," PhD diss., University of Michigan, 2005, 4–7.

[17] Lee, "Defining Digital Preservation Work," 33–34. Lee's thesis also contains appendices that detail the players in the OAIS initiative and timelines of its development.

[18] Lee, "Defining Digital Preservation Work," 46–47.

collaboration, if there is one, may be the ability to appeal to the varied interests that bring both organizations and individuals to the standards development table.

Forces Driving Standards Development

To understand the increased emphasis on standards and the desire for a more collaborative process, one needs to appreciate the forces driving their development. Certainly, the rapidly changing information environment spawns much of standards activity. Electronic records, the Internet, and a host of new technological tools are changing the way organizations do business; and, therefore, our professional standards must address how these tools integrate with records practices and vice versa. Other current major forces include

- **Changing roles and responsibilities.** The roles records professionals play inside their organizations have changed. Electronic records and electronic recordkeeping force archivists and records managers to redefine who they are and what they do. Functions once thought to be strictly the responsibility of one profession are now addressed as part of an automated information system that does not differentiate among several professions. Working with electronic information systems means that records professionals must communicate and interact with a variety of other program and technical staff.
- **Redefining practices.** Basic practices relating to record identification, classification, retention, preservation, and so on developed in the analog world must now be redefined within an increasingly complex technical environment.
- **More tools and more rules.** Recent legislation at both the federal and state levels authorizes, and in some cases, mandates the use of a variety of electronic technologies and processes. For example, the Department of Education issued standards for use of electronic signatures for loan transactions[19] and more recently issued a statement with regard to the use of electronic signatures for certain types of student academic records. Many state legislatures have enacted electronic records management laws or administrative rules.[20] These legislated mandates often include the phrase "and promulgate rules and standards," or "must meet electronic recordkeeping requirements," but provide little direction or

[19] U.S. Department of Education, "Proposed Rules on Use of Electronic Signatures," *Federal Register* 68, no. 144 (28 July 2003), 444419–22.

[20] The Wisconsin Legislature endorsed the State of Wisconsin Administrative Rule 12 in 2001. It mandates that state agencies retaining their official records only in electronic format must meet certain electronic recordkeeping requirements to ensure the viability and authenticity of public records throughout their specified retention life. See http://www.legis.state.wi.us/rsb/code/adm/adm012.pdf, accessed 1 July 2008.

definition. Similarly, colleges and universities have developed electronic records management programs and initiatives that include standards and best practice development.[21] Records professionals are asked for and likely are expected to provide guidance on compliance criteria and interpretation of recordkeeping requirements.

- **Leveraging knowledge and skills.** Certainly, archivists and records managers realize that managing electronic records requires partnering with others. We need to bring together expertise from all RIM players within an organization to accomplish program objectives. Similarly, in the standards field, we need to leverage our knowledge to create awareness of records issues within a variety of professional communities.
- **Establishing an environment of best practice.** As organizations begin to develop and adopt electronic records management policies, greater attention is paid to the programmatic activities of compliance and audit. The records management community has long been interested in standards as they promote efficiency and effectiveness, cost reduction, risk mitigation, and accountability. Increasingly, standards are used to create "a professional environment of best practice." Adherence to best practice can minimize risk by providing a best practice framework for the establishment and maintenance of recordkeeping programs. As such, standards perform a monitoring and audit role in the organization.[22]

Overview of Standards Development Processes

Records and information management standards development generally occurs in one of two ways: first informally through professional associations, second through groups of concerned individuals and organizations with formal mechanisms and procedures for standards development authorized by standards bodies such as ANSI or ISO.

Informal Standards Development

A standard often emerges because a profession identifies an issue, problem, or need to clarify and forms an official professional position on a basic concept. The development of Encoded Archival Description (EAD), for example, began as a project at the University of California-Berkeley Library in 1993 to investigate the

[21] The University of Wisconsin System established guidelines and best practices following the approval of a records management policy by the University of Wisconsin System Board of Regents. See http://www.uwsa.edu/gc-off/records/guidelines/, accessed 1 May 2008.

[22] M. Pember, "Sorting Out the Standards: What Every Records and Information Professional Should Know," *Records Management Journal* 16, no. 1 (2006): 21–33.

feasibility of a nonproprietary encoding standard for machine readable finding aids. By 1999, it was viewed as an emerging standard as archival programs increasingly began to employ computer technology and access to the Internet became more pervasive. Though the archival community followed no formal standards process in developing it, EAD is considered a standard. SAA's EAD Working Group, an arm of SAA's Technical Standards Subcommittee, is responsible for its ongoing maintenance and development.[23]

Formal Standards Development

A formal standards development process, such as those required by ANSI or ISO, dictates that certain procedures and practices be followed from the inception of the standards project through to its ultimate approval and publication. Key points of the process include

- **Openness.** Participation is open to all interested parties directly or materially affected by the activity. The standards creating group must attempt to identify and seek out all professional communities that may have an interest in the potential standard.
- **Balance.** Every effort is made to recruit a balanced team from the public and private sectors and government, as well as from vendor and professional communities.
- **Consensus.** Consensus building is emphasized throughout the process. No attempt is made to achieve unanimity of opinion, but rather to achieve a majority opinion.
- **Due process.** Standards are made available for public review and comment and there is an appeals process.

In the digital records management arena, the formal development of the OAIS model is a particularly noteworthy example. The concern for digital preservation by archives, museums, private industry, and government fostered the development of groups desiring to create frameworks, models, and, ultimately, standards that would pull together terms, concepts, technical requirements, and organizational elements necessary for the successful implementation of digital preservation. One such group is the Consultative Committee for Space Data Systems (CCSDS). In the early 1990s, CCSDS established a cooperative arrangement with ISO for standards development. The work of CCSDS led to the development of the OAIS model that became a formal ISO standard in 2002. Though it originated in the space community, development of the model was opened to a broad range of interested parties. The openness of the approach used by CCSDS permitted a broad-based collection of organizations in government,

[23] Daniel V. Pitti, "Encoded Archival Description: An Introduction and Overview," *D-Lib Magazine* 5, no. 11 (November 1999).

private industry, and academia to collaborate and achieve a common understanding of the issues depicted in the OAIS model.[24]

Neither the informal nor the formal standards development process explicitly addresses collaboration as a requirement. The requirements for openness and consensus building in the formal standards development process, however, effectively support collaboration and interdisciplinary approaches identified as fundamental to successful strategies for managing digital records. Figure 1 shows the formal standards process used in the development of ARMA-ANSI 16-2007

The Development of ARMA-ANSI 16-2007

In 2001, the ARMA SDC approved the creation of the Conversion/Migration Criteria for Recordkeeping Systems Task Force and launched procedures for developing a potential standard. In accordance with its standards development procedures, ARMA issued a call for participation. The project engendered substantial interest, and thirty-three individuals completed the call for participation. Representing a broad range of both public and private organizations, most were records managers, although the group included consultants, archivists, and vendors.

This first attempt at developing a standard failed after two years of work for two reasons. First, the project lacked focus. As originally conceived, its scope of work was too broad, which made it difficult for task force members to identify logical pieces of the topic to develop. The original project addressed both conversion and migration processes. Although these processes are related, addressing technical processes for both in the context of a single standards project proved too large a challenge. Second, standards development relating to electronic records management issues is complex and needs a leader who can become immersed in the topic and work on it consistently. Unwilling to drop the conversion process initiative, in 2003 the ARMA SDC identified the NHPRC Electronic Records Research Fellowship Program as a potential funding source. I submitted an application and was awarded a fellowship for 2004–05, and it supported my role as task force manager.

With NHPRC funding, I secured a part-time graduate student to assist in managing the project. The task force (TF) relied heavily on listservs, email, and conference calls to do its work. The work of the conversion project was conducted largely over a twelve- to fifteen-month time period, and, by the end of 2005, a working draft of the standard had been created. Following the compiling of text and a significant editing process, the working draft went out to all TF

[24] Brian F. Lavoie, "The Open Archival Information System Reference Model: Introductory Guide," *Office of Research-OCLC Inc. DPC Technology Watch Reports 04-01* (January 2004): 1–3.

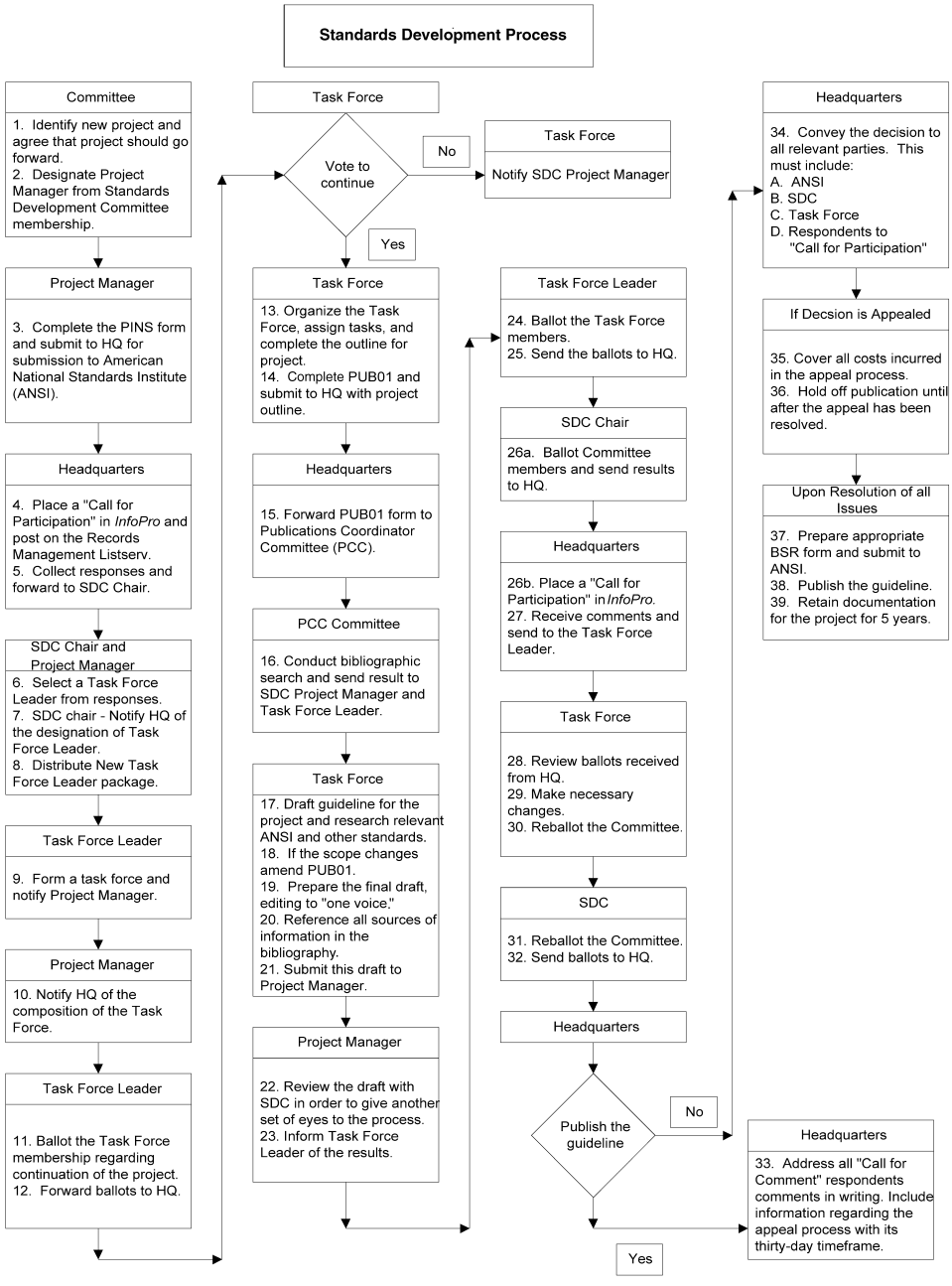

FIGURE 1. Flowchart of ARMA International standards development process as it existed at the time of the DRCP, 2004–2006.

members as well as to the ARMS SDC for review and comment. In late 2006, the draft standard was ready for public review and comment. Staff at ARMA International headquarters compiled all the comments received and the TF manager responded to them. In March 2007, ANSI approved the draft as an official standard.

TF Members and Their Contributions to the Project

The call for participation in the revamped 2004 initiative resulted in a good mix of archivists, technologists (largely from the vendor and consultant communities), and records managers. Wanting to make the project a collaborative one with the archival community, the TF manager wrote a brief newsletter article for *Archival Outlook* and posted announcements to professional listservs especially directed at recruiting archivists to participate in the project. In January 2005, the TF consisted of nineteen members—a much smaller number than expressed interest in the first initiative. Of those nineteen, five to six individuals became section leaders and drafters of text, and this group was ultimately responsible for much of the content of the standard.

To participate in an ARMA SDC standards project, prospective TF members complete a TF application. The application asks the type of organization a volunteer represents, relevant experience, project-management experience, and type of role the volunteer would like to perform, but it does not require the volunteer to state his or her profession.[25] Since ARMA supports standards development, the bulk of the TF members would be records managers. But, because professional affiliation cannot be precisely determined from the call for participation form and because several individuals on the TF lists consider themselves archivists and records managers, the exact numbers in each category cannot be determined. It is interesting to note that the consultant/vendor representation remained constant throughout the project. Is it easier for consultants and vendors to participate in such projects? Do they see a benefit to their practices or businesses to participate? Do they have greater flexibility in terms of time commitment for standards work? It is also interesting to note that educators were not a part of the final TF, perhaps because of the time commitment necessary to participate in the project or perhaps the project did not fit with teaching or research objectives.

Both the TF manager and several TF members expressed concern about the lack of technological expertise, so the TF manager recruited a former colleague at the Wisconsin State Historical Society who once held the position

[25] See ARMA SDC Task Force application online at http://www.arma.org/standards/development/taskforce/taskforceapp.cfm, accessed 10 March 2008.

of electronic records archivist there but had since become the chief information officer. One of the TF members also recruited an IT professional from OCLC to provide technological expertise. One of these individuals did formally sign onto the TF and completed the call for participation form. Both provided comments and input during the project. Ultimately, the TF included twenty-three members including the manager. (See Table 1.)

The TF members, particularly section leaders, brought with them not only their professional expertise but their own interests. These individual perspectives and interests influenced the content of the standard considerably. For example, two members with extensive experience in the business environment of the private sector were responsible for placing the conversion process within the business context of an organization. The archivists contributed a broad-based discussion on metadata, particularly preservation metadata.

The TF also had substantial representation from the United Kingdom and Canada. The international membership seemed to feel the issue of records

Table 1. Project Task Force

Digital Records Conversion Process—Project Task Force
Nancy Kunde, University of Wisconsin-Madison – Task Force Manager
Jo Katherine Goldstein, Eli Lilly and Company – Task Force Leader
☐ Lori Ashley, Cohasset Associates, Inc. – Section Leader
☐ Vicki Lemieux, CSFB – Section Leader
☐ Glen Gerken, Ungaretti & Harris LLP – Section Leader
☐ Jesse Wilkins, Access Sciences – List Moderator
☐ Charles Arp, Battelle Corporation – Section Leader
☐ Caryn Wojcik, State of Michigan – Section Leader
☐ Margaret Anderson, Collin County Texas
☐ David Best, Harvard University Archives
☐ Adrian Brown, The National Archives–United Kingdom
☐ Amy Conant, Arapahoe County Colorado
☐ Mary Cooper, Cooper Information
☐ Cynthia Dabney, LANL
☐ Margaret Duncan , Fidelity Investments
☐ Marc Fresko, Cornwell Management Consultants
☐ Earl Johnson, Millican & Associates
☐ Skip Kendall, Harvard University Archives
☐ Joanne de Repentigny, OMERS
☐ Einar Rowan, Rokom Ltd.
☐ Shawn Rounds, Minnesota Historical Society
☐ Andreas Stanescu, OCLC
☐ Jim Suderman, National Archives of Canada
☐ Carol Volle, Booz Allen Hamilton
☐ Fynette Eaton, National Archives and Records Administration
☐ Sarah Schild Cantrell – Project Assistant

conversion and the urgency of developing a standard more keenly than American members and significantly contributed to the project.

Establishing Working Relationships

A critical part of establishing a collaborative approach to standards development is communication. Yahoo groups that had been used by other task forces became the basic communication and work space for the project. The TF held periodic teleconferences to keep the project moving forward. At both the ARMA International and SAA annual meetings, TF members gathered for face-to-face conversation. These sessions not only were critical for TF members, but conference attendees had the opportunity to attend and participate in open forums on active ARMA SDC standards projects.

Even with electronic communications tools such as email, listservs, and the Yahoo group site, it was difficult to build a collaborative atmosphere and maintain communications across a broad TF membership without several face-to-face meetings. Some TF members could not access Yahoo groups, for example, because their organizations do not permit linking to such services. Perhaps more difficult, email messages often create misunderstandings because they lack the context of vocal inflections and facial expressions. In general, however, the project stayed on its stated timeline of completing a draft within twelve months, which many had speculated would be impossible.

Creating the Standard

A framework was needed to pull together complex topics and integrate them into a workable digital records conversion process that various participants in the process could understand. We constructed a diagram to depict the process visually. (See Figure 2.) The diagram put the records conversion process within the context of work flow and provided a framework for discussing issues associated with conducting a digital records conversion process.

In one early TF conversation about the project, several members noted that an organization is not likely to apply conversion processes uniformly to all its records. Recognizing that organizations make choices based upon costs, risks, and compliance issues, as well as records value, the most appropriate strategy for digital conversion should provide a structure or methodology to assist organizations in making those choices. Risk assessment and an understanding of the value of the records to the organization need to be major parts of the methodology, so that determinations can be made about which records are worth fully converting and which may not be worth such efforts. Ultimately, the selection of appropriate conversion procedures and requirements should also be based upon the appraised value of the records.

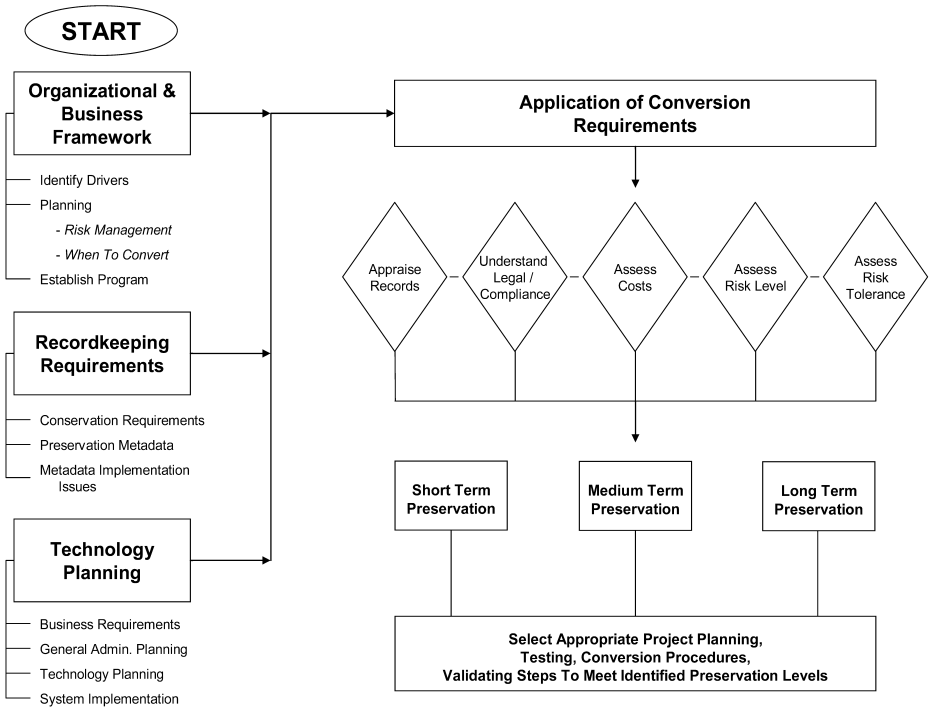

FIGURE 2. Conversion flowchart.

Terminology

Terms and definitions are critical to any standards project. Decisions about terminology were as challenging as creating a framework that could facilitate the development of the standard. The participants needed a common understanding of terms to put boundaries to the project; that is, a working definition of records conversion. The international membership of the TF added another challenge. The project consulted several different glossaries and relied heavily on the SAA glossary, *A Glossary of Archival and Records Terminology*, published in 2005; the OAIS Standard; and InterPARES reports to create working definitions of critical terms. The TF created a chart that compared the definitions of key terms with the working TF version to aid in the development of a common language. The chart appears as appendix C in the DRCP Standard, and a segment of the chart appears in Table 2.

Integrating Recordkeeping Requirements and Conversion Procedures

To meet the challenge of creating a set of digital conversion procedural requirements that would result in authentic records, the TF had to pull together

some existing records management concepts with the technical conversion process. The creation of the template in Figure 3 was an important collaborative tool. It brought together several elements:

- the source of the particular concept or term,
- the controls for that particular process or concept,
- the procedural element that will protect the concept, and
- where it occurs in the records conversion process.

The Digital Records Conversion Process Standard

ANSI-ARMA 16-2007 is the result of a collaborative, labor intensive, formal standards development process. The standard fills forty-two pages and addresses many topics. Some of the more important include

- a planning process that addresses the reasons to convert, risk management issues, planning activities including a description of a digital records conversion program (roles and responsibilities, procedures manuals);
- a discussion of recordkeeping requirements including preservation and preservation metadata implementation issues;
- technology planning for digital conversion including business and administrative requirements (project management, system test plan, system maintenance, training and education, meeting business cycle requirements, quality control, post implementation review, etc.); and
- a detailed discussion of a conversion process including the procedures, conversion project planning, testing, conversion, and validating.

The standard also provides helpful definitions of common terms, checklists, and suggested documentation. It does not go into every technical detail necessary for digital conversion, but it is a helpful resource for understanding digital records conversion; and, perhaps most importantly for records professionals, it integrates accepted electronic recordkeeping principles into the process.

Analysis of the Standards Development Process and Recommendations for Process Improvement

Standards development is frequently thought of as belonging only to the technical community. Standards relating to the permanence of paper, the processing and storage of microfilm, and environmental storage conditions are well known to records professionals. The emergence of electronic records and electronic recordkeeping provides an opportunity for records professionals to build their own standards. Organizations of every type continue to move large quantities of records into digital formats, and it is critical that recordkeeping requirements be integrated into this conversion process. Information and records are

Source	Control	Risk/Driver	Procedural Element	Order	Contributor	Data Type Exceptions	Conversion Type	Conversion Triggers
	Meet legal requirements	Loss of authority						Business-related
CGSB-72.11-93, III, 1.1	Preservation of integrity	Loss of integrity	Authorized retention of converted records	Planning	JS	N/A	All	Record-related
	Meet legal requirements	Loss of authority						
CGSB-72.11-93, III, 1.1	Preservation of integrity	Loss of integrity	Authorized disposal of source records	Planning	JS	N/A	All	
ISO14721 s.3.2.2	Preservation of integrity	Loss of authenticity	Check to ensure that data migrator has authority to migrate the data. If it is only a data custodian it may be necessary to seek additional authority from data owner.	Planning	VL	N/A	All	
	Preservation of integrity	Loss of integrity	Select an appropriate storage medium, taking into consideration the expected and actual rates of errors encountered in various media types, their performance, and their costs of ownership.					
	Technical feasibility	Loss of data						
ISO 14721 s. 4.1.1.3	Business feasibility	Affect on rendering/ presentation		Planning	VL	N/A	All	All
	Transparent conversion implementation							
	Meet legal requirements							
	Business feasibility							
ISO 14721 s. 4.1.1.6	Technical feasibility	Loss of authority	Develop migration plan and have it duly authorized.	Planning	VL	N/A	All	All
	Completeness of Content	Loss of integrity	Analyze data structure, i.e., decide what parts of the data represent "content information" and what parts represent "representation information." This step is critical to understanding what is to be preserved.				Repackaging	Format-related
ISO 14721 s. 4.1.1.6	Preservation of integrity	Loss of authenticity		Planning	VL	N/A	Reversible transformation	Platform-related

FIGURE 3. Integrating recordkeeping requirements with procedural elements in the conversion process.

strategic resources for any enterprise, and ensuring their viability requires attention not only to technical concerns, but also to a variety of people, policy, and environmental concerns. Standards such as the *Digital Conversion Process: Program Planning, Requirements, and Procedures* can play a significant role in bringing these components together and providing a basic guidance document for the records professional.

If standards and standards development are critical to RIM professionals, what can be done to improve the process so that needed standards are produced and reflect current concepts and practices from across the information management discipline?

Knowledge of Existing Standards

Normally, at the outset of standards development projects an attempt is made to find out about existing standards that may already address the proposed topic or incorporate it in some way. This is not an easy task! Standards are specialized information resources. Even major research libraries do not always acquire them. Websites of standards-making organizations do not always clearly identify their standards products, and a member code is needed to access them. Standards formally approved through a body such as ANSI or ISO must be purchased, and some are costly. Searching for standards applicable to some aspect of their work can be frustrating for RIM professionals. Ideally, there should be "one-stop shopping" for RIM standards—a website, a portal, or some type of online mechanism to facilitate searching and accessing existing standards and best practices.[26] An interesting example of gathering information on standards is the MetaMap created by the University of Montreal. It is designed to provide the information science community with an overview of metadata standards, sets, and initiatives of interest in this area.[27]

The members of the DRCP TF brought to the project awareness and expertise about existing standards, research projects such as InterPARES, and electronic records concepts. An extensive literature search at the outset of the project, shared with TF members via the Yahoo work groups site, added to that knowledge base. While DRCP TF members came to the project with an extensive amount of collective standards knowledge, this may not always be the case with other standards projects. A better way to access standards information would greatly aid the standards development process.

[26] As of September 2007 the SAA Standards Committee has an active project to create an online, searchable database of standards and best practices. The goal is to make it available via the SAA's website.

[27] See http://mapageweb.umontreal.ca/turner/meta/english/index.html, accessed 1 March 2008.

Facilitating Collaboration

Collaboration is a much-used term in the RIM field, but creating a workable framework for collaboration remains a challenge. Collaboration is recognized as a strategy fundamental to the effective management of electronic records. Since emerging standards projects will most certainly be about electronic records management, a collaborative approach to standards development makes sense. Furthermore, incorporating expertise and developments from related fields such as information technology and library management will strengthen and enhance the usability of standards products. In addition to benefiting standards products, collaboration can aid in extending some basic understanding and education about the concepts and requirements of various aspects of RIM to those outside the field.

The conversion procedures project benefited greatly by collaboration; an effort was made to seek broad participation from both archivists and records managers, records professionals from outside the United States, and information technologists. ANSI procedures require broad participation and consensus building, but no clear roadmap exists for how to incorporate collaboration. Ultimately, however, the task force manager must build collaboration. Agreed-upon strategies or agreements between organizations about sharing information on standards projects could aid in the building of a workable framework for collaborative standards development. Establishing formal, routine communication channels among the standards development committees of professional organizations and cooperatively built websites would be extremely helpful. ARMA and SAA have informally recognized collaboration. The chairs of the standards committees of both organizations developed a draft "Memo of Understanding" regarding standards development. It incorporates some of the suggestions outlined here as well as others, along with, most importantly, some "how-tos." The objective is to build collaboration into the formal governing structure of the organizations, so that it is acknowledged formally as a need. Early in 2008, SAA and ARMA signed the memo,[28] which recognizes the importance of standards development to both organizations and provides for the establishment of a governing structure to support collaborative standards development. Perhaps in the near future, ARMA and SAA, the two professional associations with knowledge, skills, concepts, and practices fundamental to records management, will share a recognized framework for collaboration.

Unlike the "streams of activity" that came together to generate the OAIS standard, the DRCP initiative attempted to pull some streams of activity together at the outset. Both ARMA and SAA endorsed the ARMA records conversion

[28] The MOU between ARMA International and SAA was executed by the executive directors of both organizations in April 2008. The MOU appeared as an attachment to the SAA President's Report to Council in February 2008.

standards initiative, and the membership of the original Task Force included a broad spectrum of archivists and records managers as well as individuals who wear both hats for their employing organizations. It provided an opportunity for both archivists and records managers to consider the records issues collaboratively for a critical process, digital conversion. Hopefully, more such collaborative standards initiatives will be undertaken in the future.

Integrating Information Technology and Archives and Records Management Concepts

Closely related to collaboration is developing ways to integrate information technology issues and requirements into standards development projects. Electronic records management presents challenging and complex issues to records professionals, who acknowledge that information technology specialists must be more involved. Several questions surfaced periodically in the conversion standard project: How technical should the ultimate draft standard be? Is what we are proposing technically feasible? The DRCP TF was fortunate to have members with substantial technical knowledge, and the TF manager drew upon a former archival colleague for added advice and expertise. As new records professionals come into the field with substantial backgrounds in IT, some of this need for technology advice may be resolved. It will, however, still be important to be able to tap into and integrate RIM concepts with technology. Standards need to be as forward looking as possible (especially since the development time is extensive). Will tools coming into the marketplace incorporate RIM standards and best practices? How difficult will it be to "make it work"?

Acquiring Resources for Standards Development

Standards that address critical information management processes such as conversion are an important component of the practicing records professional's toolkit of helpful resources and how-to guidance. The archival and records management professions demand more of them. However, the development of guidelines, best practices, and standards is time consuming; particularly in the area of electronic records, which involves complex issues. Addressing these issues and developing a draft document requires significant amounts of time and resources not easily contributed by volunteers. For archivists and records managers who are a part of small programs with numerous responsibilities, active participation in a standards development project is a major commitment. Additionally, standards initiatives can go on for a long time simply because participants cannot devote the amount of time necessary to fully develop a project.

During the DRCP project, TF members who were all volunteers prepared the initial drafts of the document. Many TF members were also involved in regular conference calls and email communications, ensuring that the project moved along. I am deeply grateful for their time, effort, and contributions.

Volunteers are needed. They ensure that the document is unbiased, not skewed or unduly influenced by any organization or industry. But, basic resources are necessary for records and information management standards projects, both to support the commitment of professionals who volunteer their time and to aid the efficient and timely development of a document. The DRCP TF was fortunate to receive NHPRC funding through its Electronic Records Research Fellowship Program to support task force management. A portion of the funding was used to employ a graduate student to aid in conducting background research and to do the final text editing on the draft document. With this support, the project was able to meet its goal of producing a draft document within a year's time. Meeting that goal provided a real sense of achievement to the TF participants.

ARMA International also greatly aided the DRCP project. It provided the support for conference calls, mailings, and other administrative tasks. However, TF participants had to rely upon the good graces of their supervisors or employing organizations to supply release time for them to work on the standards project. If records and information management professional organizations desire more standards and best practices, they must also be willing to support them in a more substantial way by proposing standards development processes and procedures that represent workable and effective strategies, investing in technology tool suites that facilitate document sharing and regular communications, logging of text changes, and supporting collaborative strategies with related professional associations. In sum, regular support for standards activities would place the archives and records management professions in a more proactive position with regard to the growth in information technology. Major shifts in technologies now occur every eighteen months to three years. If the information management community wishes to meet this challenge, it must produce standards and best practices in a more timely and efficient manner.

Professional association budgets obviously have numerous demands placed upon them, and so other resources need to be identified that will support standards development on a regular basis. Granting agencies such as the NHRPC should be encouraged to include standards development as one of their funding priorities.

A Need for Methodologies to Weave Together Recordkeeping Requirements and Technical Processes

A major hurdle for the work of the project was the need to develop a methodology for integrating the components of the technical process of digital

conversion with the conceptual issues of recordkeeping. Task Force members put together an extensive template to aid their work. While it is difficult to speculate about the applicability of such a tool to other standards development projects, the template proved invaluable both in terms of understanding the issues as well as in crafting the draft standard. It may be that as other standards are produced that address digital records, other templates and methodologies will emerge that can facilitate the process of standards development. Hopefully, information sharing among those participating in such standards development projects will help to identify those methodologies, structures, and models that work as well as those that do not.

Standards as Educational Resources

Standards also educate those outside the information management discipline about RIM concepts and practices, especially in communicating with information technology specialists. The technology community appreciates and respects standards. IT professionals commonly reference standards for everything from bandwidth to encryption codes and recognize the fundamental value and benefit of standards in communicating and processing information. Encouraging IT specialists to participate in RIM standards development projects or to test potential standards will help them to understand records management and archival requirements and to incorporate them into their operating procedures. Standards, then, can be a helpful tool to establish collaborative strategies with IT, a recognized component of building successful electronic records management programs.

Conclusion

The success or failure of the DRCP rests with those who apply it in their work places. Only then will its true merits be known. The process that created it was often clumsy and seemingly endless, but the commitment of Task Force members made it happen. Standards and standards development depend on working records professionals who make time to participate in standards initiatives or implement a given standard in the work place and report the results to colleagues. Records professionals should get involved in the process, but they must be prepared to discuss technical issues. They may not need to be highly developed information technology specialists, but they should possess enough technical knowledge to address technical processes comfortably and suggest ways in which recordkeeping integrates with those processes.

Roadmaps to collaboration do not exist, a fact important to recognize at the outset of any standards making projects. Standards that bring together the

theory and practice of records and information management and simultaneously address the technical implications provide strong, sound guidance to archivists, records managers, and information technology specialists. Standards development is an opportunity to shape fundamental professional literature that influences how archivists, records managers, and others will carry their work into the future. The time commitment can be substantial but participation in standards development initiatives offers substantial knowledge and experience and the chance to engage with fellow records professionals on major issues of professional concern.