Building a state government digital preservation community: Lessons on interorganizational collaboration

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ABSTRACT
As a part of the National Digital Information Infrastructure and Preservation Program (NDIIPP), the Library of Congress sponsored a series of collaborative workshops between April and May 2005 to help state governments identify their needs and priorities for digital preservation. During these workshops, state and territory representatives showed strong interest in fostering partnership efforts and collaborative strategies toward preserving state government digital information. Based on the findings of the workshops and previous efforts on digital preservation, this paper discusses the challenges and opportunities regarding interorganizational collaboration and community building for digital preservation of state government information.

Categories and Subject Descriptors
K.6.0 [**Management of Computing and Information Systems**]

General Terms
Management, Human Factors, Standardization

Keywords
Digital Preservation, Interorganizational collaboration

1. INTRODUCTION
The rapid development of information technology has dramatically changed the way information is created, stored, and used in the public and private sectors in the United States. At the state government level, vast amounts of information is created in electronic form, including land data, school records, official publications and court records. For instance, a recent study [8] reports that over 50% of North Carolina state government publications are produced and disseminated in digital format only. Although the digitization of government information can promote efficiency, searchability and accessibility, it involves difficult challenges as well; the long-term preservation of electronic records is one of them. Much of electronic government information is of permanent legal, legislative, or cultural value, yet is at significant risk of loss because of fragile media, technological obsolescence, and other difficulties. As a 2003 American Association of Law Libraries study concludes, however, the need to preserve electronic government information is "yet unmet in any comprehensive manner either at the federal, state or local level." [9]

In order to address these issues, Congress enacted the National Digital Information Infrastructure and Preservation Program (NDIIPP) legislation in December 2000. The legislation charges the Librarian of Congress to lead a nationwide planning effort for the long-term preservation of digital content, as well as to capture current digital content that is at risk of disappearing. [13] As a part of the NDIIPP, the Library of Congress (LC) aims to include state governmental entities (state libraries, archives, and other state agencies) in the national network to preserve "born digital" state and local government information that is both significant and is at risk of loss. The Center for Technology in Government (CTG), a digital government research center at the University at Albany, has been working with the LC since September 2004. The main responsibility of CTG is to develop a capability assessment and planning toolkit [11] to support the preservation efforts of state governments.

Between April and May 2005, LC sponsored three workshops to help states identify their needs and priorities for digital preservation. CTG played a key role in planning, facilitating, and analyzing the results of the workshops. This paper reports the findings of the workshops and discusses the challenges and opportunities regarding interorganizational collaboration and community building for digital preservation of state government information.

2. THE LIBRARY OF CONGRESS CONSULTATION WITH STATES WORKSHOPS
2.1 Purpose and Audience
Beginning in March of 2005, LC invited U.S. states and territories to form collaborative arrangements and develop strategies for preservation of significant state and local

government information in digital form. The invitations were sent to the heads of state libraries and state archives and territorial equivalents. LC requested that each state library and archives consult between themselves and also as appropriate with other stakeholder entities in their state to determine the composition of the best team to participate in one of the three workshops. In the invitation, the Library indicated that it was strongly interested in active collaborations within and between states to address a shared approach to digital preservation. The Library stated that, ideally, this approach draws on an association among various entities with a stake in the long-term management and preservation of government digital information in each state, such as the state library, archives, records management organization, county clerks and other agency information custodians, and chief information officer (or information resource executive).

The purpose of the workshops was to collect facts, perspectives, and recommendations regarding digital preservation of state government information from librarians, archivists, records managers, information technologists, and other professionals representing U.S. states and territories. LC, in collaboration with the Center for Technology in Government, used the workshops to work with the state and territorial participants to collect this information through a series of large and small group facilitated discussions and exercises.

The three one-day workshops were held on April 27th, May 11th, and May 25th. The first and third workshops were held in Washington, DC, and the second one was held in Baltimore, Maryland. Three separate dates were selected in order to facilitate participation from all states, territories, and the District of Columbia. All 50 states, the District of Columbia, and three territories sent representatives to one of the three Spring workshops. Across the three workshops, 67 librarians, 53 archivists, 13 records managers, and 20 IT professionals were in attendance. While it was up to the individual participants and their other state or territory representatives to select the workshop date, each of the three workshops had a geographically diverse mix of states in attendance. Each workshop had between 14 to 19 states and at least one territory represented. Also in attendance at each of the three workshops were a small group of observers from other federal agencies and professional associations interested in digital preservation, including National Archives and Records Administration (NARA), Institute of Museum and Library Services (IMLS), Government Printing Office (GPO), Council on Library and Information Resources (CLIR), National Historical Publications and Records Commission (NHPRC), and Council of State Historical Records Coordinators (COSHRC).

2.2. Workshop summary

Each workshop was structured to include presentations on NDIIPP and large and small group-facilitated discussions and exercises involving all of the state and territory representatives. A round robin large-group discussion focused on top concerns relating to digital preservation, major success stories, and areas of interest to discuss with other states. And small group breakout sessions, facilitated by CTG and LC staff, focused on three basic issues of concern to LC about preservation of state government digital information in the states and territories. For all three workshops, state and territory teams were assigned to one of four small groups. Each of the four small groups was comprised of between 4-6 states. Each small group spent between 45 to 60 minutes working on exercises and engaging in facilitated discussions focused on the following three questions:

1. What kinds of digital content are at-risk and what are the priorities for preservation?
2. How can states extend or build partnership networks?
3. What preservation-related roles do states and the Library need to fill?

2.2.1. At-risk state government digital information

As shown in Table 1, the categories of information that are considered most at risk by the state participants were government records, databases, digital publications, Web sites, and e-mails.[1] There were also informative discussions on issues concerning particular types of content, such as voluminous and dynamic characteristics of Web sites and e-mails and migration concerns on legacy documents and obsolete formats.

2.2.2. Preservation Partnerships

The workshop participants identified many existing networks that currently support partnerships for digital preservation. The networks identified in all three workshops are:

- Within states: municipal and local associations, task forces, GIS community
- Between states: National Association of Government Archives and Records Administrators (NAGARA), Online Computer Library Center (OCLC)
- Between states and private sector: OCLC
- Between states and federal government: NHPRC, National Endowment for the Humanities (NEH), IMLS, LC/NDIIPP, NARA, GPO

Also, the participants in all workshops regarded information sharing and education as a means to leverage partnerships, and competing priorities, lack of funding, lack of knowledge, and different perspective of IT people as barriers to partnerships.

[1] Note that some categories are not mutually exclusive. Since the characteristics of workshop discussions was close to that of brainstorming sessions, the classification of categories was not done in a very rigorous manner. For example, Web contents fall into government publication (by the nature of content itself) and Web sites (by the media). For more detailed data from the workshops, including the number of votes, see [14].

Table 1. At-risk state government digital information, in order of importance as voted by workshop participants

At-risk digital information	Examples
Records	born-digital official records, legal records, legislative records, property records, working documents, poorly scanned materials without hard copies
Databases	e-government transactional databases, GIS, fiscal databases, electronic filings, agency records in database format
Digital publications	government publications, Web-based publications, statistical reports, forms, information about state
Websites	Web contents of value, state government Web sites, agency Web sites, governors' Web site
Email	agency e-mail, public and private correspondence, links, instant messaging, official e-mail records, Public records in email format
Data sets	GIS, voter list, legacy data, data files
Audio & Video	multimedia, digital video and photos, digital recordings of legislative proceedings and public meetings, public broadcasting
State-wide elected officials and agency heads	governor's, Attorney General's, state legislature
Geographic information systems (GIS)	
Migration issues	legacy documents, legacy systems proprietary, obsolete formats
Internal Documentation	electronic source documents for subject files, developmental process behind documents
Document conversion	digital images
E-filings transactions	court records, vital records, deeds, wills
Restricted information	
Cultural heritage	history and culture, indigenous languages
Administrative metadata	
Maps	

2.2.3. State and LC Roles and Responsibilities in Support of Digital Preservation

Preservation-related roles and responsibilites for LC, in order of importance as voted by workshop participants, are as follows:

- Funding
- Best practices
- Coordination/facilitation/ Partnership
- Clearinghouse
- Standards
- Training/ Education
- Advocacy
- Archiving
- Promotion
- Direct services

Providing funding, developing best practices, and promoting collaboration/facilitation were LC's roles that received most votes in all three workshops. Training/education and development of standards were common items as well.

The roles for state governments, in order of importance as voted by workshop participants, are:

- Records selection/ Collection management
- Legislation/policy and Legal issues
- Access
- Communication/ Collaboration
- Funding
- Leadership/ Advocacy/ Education
- Strategic planning
- Setting priorities
- Creating infrastructure
- Guidance to employees
- Partnerships
- Standards
- Involving stakeholder
- Foundation
- Collecting and preserving its own records
- Implementation
- Demo projects
- Building the infrastructure without duplication
- Statewide digital initiative
- Technological tools

3. DISCUSSION

3.1. Interagency and Interprofessional Collaboration

The main actors in a digital repository system are producer (information provider), management (professional), and consumer (user) [2, 3]. The collaboration among these actors as well as within each class of actors is crucial for ensuring the preservation of and the long-term access to digital records. More specifically, collaborative efforts in digital preservation can bring the following benefits [15]:

- Access to a wider range of expertise
- Shared development costs
- Access to tools and systems that might otherwise be unavailable
- Shared learning opportunities
- Increased coverage of preserved materials
- Better planning to reduce wasted effort
- Encouragement for other influential stakeholders to take preservation seriously
- Shared influence on agreements with producers
- Shared influence on research and development of standards and practices
- Attraction of resources and other support for well-coordinated programs at a regional, national or sectoral level

For the successful digital preservation of state government information, an agency responsible for preservation, as the management of system, needs to leverage partnerships with various stakeholders such as private sector entities, other state governments, the federal government, local governments, other branches of state government, and other state government agencies. The following discussion focuses on interagency and interprofessional collaboration among librarians, archivists, records managers, and IT staff, which was one of salient issues in the workshops.

Most research in digital libraries so far has taken systemcentric approaches to address how the service will be provided and does not explore in detail the roles of and the relationships between different actors in the digital preservation community [2]. Particularly, the influence of different perspectives and behaviors of these actors on interactions between them in public sector was rarely examined. Although not specifically focused on long term preservation of digital information, there have been collaborative efforts between librarians, archivists, and information technologists for electronic records management in academic institutions. The Coalition for Networked Information (CNI) was formed in 1990 to bring together the content expertise of librarians and the networking expertise of information technologists. According to CNI's Working Together workshop report [7], the factors motivating collaboration include executive mandates, scarcity of financial resources, the interdependence of librarians and information technologists, the desire to consolidate overlapping functions, the need to incorporate the other professional group's perspectives into project design, while time and costs needed for partnerships, differences in organizational culture, lack of respect for the other profession, and personality conflicts mitigate against successful partnerships. Also, McGovern and Samuels [11] emphasize the importance of collaboration between archivists and IT staff at colleges and universities. Such partnerships bring together archivists' knowledge on the value and context of records, identification and selection of content, and legal issues and information technologists' expertise on structure of records, networked environment, and technical issues. The authors contend that other professionals such as legal counsel, auditor, and financial officers also need to join this partnership for successful electronic records management.

Some academic studies in other areas such as health care and criminal justice contain detailed discussions on interprofessional and interdisciplinary collaboration. For example, Hall [5] explains the influence of different professional cultures on interprofessional teamwork. Professional culture, which includes values, beliefs, attitudes, customs, and behaviors, is established by means of education and socialization and remains obscure to other professions. Although different cultures pose challenges such as unfamiliar vocabulary, different approaches to problem solving, and a lack of common understanding of issues and values, they can lead to synergistic efficiency, creative solutions, and improved job satisfaction if properly leveraged.

Workshop attendees with different professional backgrounds expressed different concerns and interests regarding digital preservation [14]. Librarians tend to emphasize permanent public access and item-level description and control. On the other hand, the archival focus was on handling aggregates rather than items. IT staff were generally less concerned with information itself and were more interested in methods for information management and control, particularly system security. As for content types, librarians regarded electronic publications most important, while archivists and records managers were most concerned with the preservation of public records.

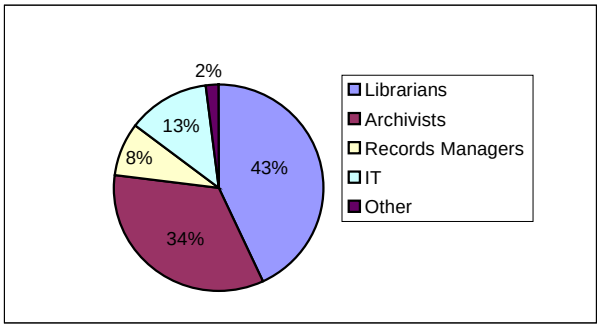

Figure 1. Summary of workshop participants

The contradiction between librarians/archivists and IT staff was particularly salient in the workshop discussions. The workshop participants, mostly composed of librarians, archivists, and record managers as shown in Figure 1, listed as barriers to successful partnerships different professional perspectives, backgrounds, and work cultures between

librarians/archivists and technologists, professional stereotypes, lack of bridging professionals, and IT staff's lack of knowledge on library networks, and suggested closer relationship between librarians/archivists and state CIOs, educating IT people on archivists and librarians' work and getting different professionals to talk together. The lack of shared language between archivists and information technologists leads to poor communication between the two professional groups. For example, for archivists the term *archives* is a noun which refers to a place where public records or other important historic documents are kept, or the records or documents that are so preserved. But for information technologists, *archive* is a verb meaning to transfer information to a storage location containing infrequently used files, for example, from disk to tape. [1]

Interagency settings in state governments pose more challenges to collaboration in digital preservation. In many cases, as stated by workshop participants, state libraries, archives, records management agencies, and IT departments have formed multiple silos and battle for their "turf". As a result, the communication and sharing of information across these agencies are hindered, and the collaboration becomes more difficult. Based on the results of their international case studies, Dawes and Prefontaine [4] assert the need for a formal institutional framework and relevant technology choice for successful interorganizational collaborations in the public sector. These themes appear consistent with the findings of the workshops in several ways. First, the institutional legitimacy for the digital preservation partnership began with a basis in law (the NDIIPP legislation) and was reinforced by the sponsorship of a recognized authority (LC). The state representatives showed a strong willingness to gather together on a regular basis and network with one another. The establishment of more formal partnership structures between states would facilitate more communication and secure the collaboration against political changes. Second, the choice of technology tools, especially metadata and preservation standards, was one of the main topics of the workshop discussions. Many attendees regarded the development and enforcement of national standards as one of the critical roles of LC. However, the findings of Dawes and Prefontaine imply that such tasks will be challenging ones, as the nature, cost, and cost distribution of the technology choice will have a significant influence on the participation and performance of this initiative. The fact that many agencies have interests in the metadata and preservation standards they have already chosen and are using is likely to further complicate this issue.

As shown in Table 2, UNESCO *Guidelines for the Preservation of Digital Heritage* provides four structural models of collaboration for digital preservation [15]. Among these models, the centralized distributed model appears to be most relevant for the digital preservation of state government information at this stage, since LC is capable of and willing to take responsibility as facilitator and coordinator. As the workshop findings regarding the roles for LC and states suggest, LC can assist states to identify and preserve their own records by providing funding and coordinating standards setting processes. This way participants can benefit from economies of scale in infrastructure investments and diverse expertise and experiences.

3.2. Building a Digital Preservation Community

Wenger's theory of "community of practice" [16] provides useful insights on why and how the digital preservation community should be established. Communities of practice are "groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis." [17] They operate as "social learning systems" where practitioners connect to solve problems, share ideas, set standards, build tools, and develop relationships with peers and stakeholders. Because they are inherently boundary-crossing entities, communities of practice are a particularly appropriate structural model for cross-agency and cross-sector collaborations.

The librarian community, the archival community, and the information technology community can be regarded as separate communities of practice in that they consist of self-selected members, aim to develop member's capabilities and exchange knowledge, and are held together by passion, commitment, and identification with the group's expertise. [18] According to Wenger [16], different communities of practice can be interconnected by boundary objects (reificative connection) and brokering (participative connection). First, the reificative connection is provided by shared artifacts, documents, tools, concepts, and other objects around which communities of practice can organize their interconnections. Second, participative connection is provided by people with multimembership who can introduce elements of one practice into another. The two are complementary in that boundary objects can overcome the physical limitation of participative connections, and brokering can solve the problem of ambiguity in reificative connections. When the connection between different communities of practice becomes established and provides an ongoing forum for mutual engagement, it can produce a new boundary practice, and ultimately a community of practice in its own right. Many communities of practice, including new scientific disciplines, have been established in this way.

The findings of the workshops indicate the need for connecting different communities and creating a new community of practice for digital preservation. First, the majority of participants demanded best practices and standards for digital preservation, which are reificative objects that can provide a means of coordinating different perspectives. Second, there was strong interest in meeting again to regularly revisit the issues facing digital preservation efforts. This is considered to be evidence of participatory connections across communities of practice.

Table 2. Structural models of collaboration for digital preservation

	Centralized distributed model	More equally distributed model	Very highly distributed collaboration	Standalone arrangements
Structure	• Consists of a partner that leads on policy, sets directions and provides most of the infrastructure, working with many others who have clearly specified but limited roles, such as identifying materials to be preserved and adding metadata, with limited responsibility for long-term maintenance	• Consists of a number of partners with similar levels of commitment and responsibility	• Consists of a large number of partners, each playing a very restricted role, perhaps limited to self-archiving	
Strengths	• Cost sharing • Pool of ideas and perspectives • Economy of scale • Better controlled processes • Efficient decision making	• Cost sharing • Pool of ideas and perspectives • Encourages shared level of ownership • No pressure of making decisions alone	• Low costs for each partner • Useful starting point for a preservation program, raising awareness and allowing some steps to be taken	• May contribute to later collaboration by allowing programs to develop expertise, strategies and systems before looking for suitable partners
Weaknesses	• May not encourage ownership of the program among the peripheral partners • May not be effective in encouraging transfer of skills from the central agency	• May be difficult to establish effective leadership • Consultation and decision making may be time-consuming • Economy of scale may be lost	• Unlikely to offer much reliability without a large investment in specifications, training and checking • May lead to high costs overall • May have trouble addressing long-term preservation issues in a coordinated way	
Relevant areas	• Beginning programs seeking to collaborate with large, advanced programs • One program willing to take ongoing responsibility and a number of others who can help but are not sure about their long-term commitment	• A number of players willing to share responsibility but none wanting to lead a program	• A number of small sites capable of taking some limited responsibility, especially if there is one partner able to play a coordinating role • Materials for which preservation is desirable rather than essential	• Programs operating in an environment where there are no suitable potential partners
Example	• A central records authority working with government business agencies, setting standards and providing guidance	• A group of data archives that decide to agree on standards and share specifications for purchasing computer equipment	• Networks of local community projects that decide that they will all keep their material for posterity	• A small research facility decide that its data must be preserved and set up a modest program to document, back up and migrate its data, hoping to eventually find a program that will take responsibility for it

Note: Based on Webb, C. *Guidelines for the Preservation of Digital Heritage.* United Nations Educational, Scientific and Cultural Organization, Paris, Mar. 2003. 62-67.

The creation of a state government digital information preservation community would allow reconciling different perspectives of librarians, archivists, records managers, and IT staff, and utilizing their expertise for successful digital preservation. Snyder et al [12] illustrate examples of successful communities of practice in the federal government. Among these examples, the case of the e-regulation community appears particularly relevant to our discussion. The e-regulation community consists of professionals in IT and knowledge management, and records management from ten federal agencies and aims to develop an electronic compliance and records management system. The community, which started from an effort to share best practices with other agencies to meet statutory mandates, has promoted cross-agency collaboration and knowledge-sharing. Following these discussions on community of practice, a "state government digital information preservation community" could be structured as in Table 3, and incorporated into the national digital preservation network.

Table 3. State digital preservation community

Sponsor	The Library of Congress
Domain	Preserving the digital information of state governments
Members	Librarians, archivists, records managers, and CIOs and IT staff in state and territorial governments
Activities	Meetings, sharing best practices and project ideas, joint projects
Outcomes	Increased collaboration between states and within a state

4. CONCLUSIONS

One of the basic themes that emerged from 2005 Library of Congress Consultation with States Workshops was the need for collaboration among librarians, archivists, records managers, and CIOs and IT staff to preserve the digital information of state governments. The workshop findings show that the information professionals in state governments are willing to collaborate with one another, but face challenges such as different interests and professional culture, a lack of common understanding of issues and values, and language barriers. In order to reconcile different perspectives of information professionals and utilize their expertise, we make the following recommendations.

First, establish a "state government digital information preservation community" and incorporate it into the national digital preservation network. The community, composed of librarians, archivists, records managers, and CIOs and IT staff in state governments and supported by LC, could promote collaboration for digital preservation within a state as well as between states by sharing best practices and information and conducting joint projects. Second, adopt a centralized distributed model as the structural model for collaboration in order to benefit from economies of scale in infrastructure investments and diverse expertise. In this approach, LC could help states to identify and preserve their own records by providing funding, facilitated standards development, and coordination. Third, establish more formal partnership structures between states in order to facilitate communication and secure collaboration and institutional legitimacy against political changes. Fourth, LC could function as a clearinghouse for standards, models, and best practices for digital preservation of state government information in order to facilitate communication and knowledge sharing between states.

As workshop findings suggest, interorganizational and interprofessional collaboration is only one of many important issues involved in the preservation of government digital information. Future research efforts will need to address other problems such as content appraisal and selection, the choice of metadata and preservation standards, sustainable funding, and long-term access to records as well.

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