Interorganizational collaboration and community building for the preservation of state government digital information: Lessons from NDIIPP state partnership initiative

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A B S T R A C T

As a part of the National Digital Information Infrastructure and Preservation Program (NDIIPP), the Library of Congress (LC), partnering with the Center for Technology in Government (CTG), launched an effort in 2005 to integrate state governmental entities into the national network to preserve born-digital information that is both significant and at risk of loss. The main theme that emerged from the efforts of LC, CTG, and the state and federal digital preservation community was the importance of partnership efforts and collaborative strategies for the preservation of state government digital information. Based on the findings of the initiative, this paper discusses challenges and opportunities regarding interorganizational collaboration and community building for digital preservation of state government information. Following the community of practice framework, it is recommended that a “state government digital information preservation community” be developed to facilitate collaboration across agencies and knowledge professionals in state governments.

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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. Government agencies, for example, create vast amounts of information in electronic form including land data, school records, official publications, and court records. An increasing quantity of these materials is "born digital," in other words, created digitally with no paper equivalent. A 2003 study reports that over 50% of North Carolina state government publications are produced and disseminated in digital format only (Martin and Reagan, 2003). Although the digitization of government information can enhance efficiency, searchability, and accessibility, it also creates new challenges for government agencies. The long-term preservation of these electronic records is one of them. Much of electronic government information is of permanent legal, legislative, or cultural value, yet it is at significant risk of loss because of fragile media, technological obsolescence, and other difficulties. Unfortunately, no systematic solution to the problem has been identified. 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" (Matthews, Burnett, Cain, Dow, McFadden & Baish, 2003).

In order to address these issues, in December of 2000 Congress enacted the National Digital Information Infrastructure and Preservation Program (NDIIPP) legislation. 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 at risk of disappearing (LC, October, 2002). NDIIPP involves a number of domains covering digital content in both the public and private sectors including academic institutions, financial and entertainment industries, and mass media. The domain of interests in this study is the preservation of electronic information of state and local governments. The Library of Congress (LC) aims to integrate state governmental entities including state libraries, archives, and other state agencies into the national network to preserve "born digital" state and local government information that is both significant and at risk of loss. The Center for Technology in Government (CTG), a digital government research center at the University at Albany, worked with the LC in this effort from September 2004 until September of 2006. In this initiative, CTG worked with LC to plan and facilitate collaborative workshops, to develop and administer the baseline survey, to analyze the results of the workshops and the survey, and to produce related toolkits and reports.

In April and May of 2005, LC sponsored three workshops to help states identify their needs and priorities for digital preservation. Over 150 representatives from state and territorial libraries, archives,
Attraction of resources and other support for well-coordinated programs at a regional, national, or sectoral level

To effect the successful preservation of state government digital information, those agencies responsible for preservation need to leverage partnerships with various stakeholders including other state and local government agencies, other states, the federal government, and private sector entities. The discussion in this paper focuses on interagency and interprofessional collaboration among librarians, archivists, records managers, and IT staff.

As Borbinha et al., (2005) found, most research in digital libraries thus far has taken system-centric approaches to address how services will be provided, and does not explore in detail the roles of (and the relationships between) different actors in the digital preservation community. In particular, the influence of different perspectives and behaviors of these actors on interactions between them in public sector needs to be 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 workshop report (Lippincott, 1998), 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.

McGovern and Samuels (1997) 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 concerning information technologists’ expertise on the structure of records, networked environments, and technical issues. The authors contend that other professionals including legal counsel, auditors, and financial officers need to join this partnership to ensure successful electronic records management.

Some academic studies in other areas (e.g. health care and criminal justice) contain detailed discussions on interprofessional and interdisciplinary collaboration. Hall (2005) 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 with 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.

Interagency settings in state governments pose challenges to collaboration in digital preservation. In many cases, different agencies involved in preservation of digital records including state libraries, archives, records management agencies, and IT departments form multiple silos1 and battle for their “turf.” As a result, communication and the sharing of information across these agencies is hindered and the collaboration becomes more difficult. Based on the results of their international case studies, Dawes and Prefontaine (2003) assert the need for a formal institutional framework and relevant technology choice for successful interorganizational collaborations in the public sector.

3. The library of congress consultation with states workshops

Beginning in March of 2005, LC invited U.S. states and territories to a series of workshops designed to begin the process of forming collaborative arrangements and developing collective strategies for preservation of significant state and local government information in digital form.2 The workshops were also used to collect facts, perspectives, and recommendations regarding digital preservation of state government information from librarians, archivists, records...
managers, and information technologists representing U.S. states and territories. A series of large and small group facilitated discussions and exercises focused on the following 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?

The categories of information considered most at-risk by the state participants were government records, databases, digital publications, websites, and e-mails. There were also numerous discussions on issues concerning particular types of content, the voluminous and dynamic characteristics of websites and e-mails, and migration concerns about legacy documents and obsolete formats.

The workshop participants identified many existing networks within and across states, the federal government, and the academic and private sectors, that currently support partnerships for digital preservation. Also, the participants in all workshops regarded information sharing and education as a means to leverage partnerships while they identified competing priorities, lack of funding, lack of knowledge, and the differing perspectives of IT staff as barriers to partnerships.

The most important preservation-related roles and responsibilities for LC, as voted by workshop attendees, were providing funding, developing best practices, and promoting collaboration/facilitation. On the other hand, records selection/collection management, legislation and policy, and managing access were regarded as roles for state government.

Partnerships emerged as one of the most viable strategies for securing the necessary resources and capabilities for digital preservation. Whether these partnerships span units within a single agency, or multiple state and local governments (and in some cases the federal government), their development requires knowledge of capabilities and priorities to be shared among potential partners. Despite many barriers, there was no shortage of earnest optimism and suggestions for fostering partnership efforts and collaborative strategies toward preserving state government digital information.

4. State government digital information preservation survey

Workshop participants agreed that access to basic information about the existence and nature of ongoing preservation activities in other states was necessary in order to build new or strengthen existing partnerships. In response to this interest, CTG worked in cooperation with an advisory committee composed of experts from professional organizations and state agencies in order to create a state government digital information preservation baseline. The survey, which was web-based and designed using the SurveyMonkey software, was sent to 125 state/territorial librarians, archivists, and records managers from all 50 states, the District of Columbia, and four U.S. territories on January 11, 2006. Collaborative responses were encouraged to promote awareness of digital information preservation activities among the various units within each state and to produce the most comprehensive and informative state profiles. As a result, 100 of the 125 survey recipients from 50 states and three territories responded (separately or as part of a combined state response) for an overall response rate of 80%. The survey responses represented 42 state libraries, 13 archives, 5 records management units, 35 combined archives/records management units, 8 IT departments, and 5 other units.

The survey addressed questions in the following areas:

1. Institutional Roles and Responsibilities
2. State Government Digital Information Preservation Activities
3. Training Needs for Digital Preservation
4. State Government Digital Information Currently At-Risk
5. Engagement with Enterprise Architecture

The findings from the survey provided many insights regarding collaboration among librarians, archivists, records managers, and IT professionals for preservation of state government digital information. First, it was found that authority for setting standards and responsibility for providing digital preservation services is dispersed. The IT unit, in particular, stands out across all three branches of government as holding a significant role in the standards-setting process and in providing services related to digital preservation. The units identified as consistently playing a central role included the office of the state CIO (or its equivalent) and IT units in the legislative and judicial branches.

Second, executive, legislative, and judicial agencies in state governments operate parallel standards-setting and service-provision efforts in support of digital preservation. Survey findings consistently show that units other than the state libraries, archives, and records management (LARM) units have the authority to set standards for digital information created and maintained by government agencies. Even within the areas generally considered to be within the realm of state LARM units – retention and disposal – legislative and judicial agencies are operating independently to a great degree.

Third, many states have been successful in at least one (if not several) areas of digital preservation including building successful funding models, training programs and collaborative partnerships, establishing clearly defined roles and responsibilities for digital preservation, and building effective technical tools and infrastructure.

Fourth, states are not fully utilizing enterprise architecture (EA) efforts to establish the centrality of digital preservation to enterprise-wide information management responsibilities. EA activities can provides an ideal opportunity for integrating the full range of management, policy, and technology issues related to the preservation of state government digital information into enterprise-wide information and information technology related decision making and planning. Also, EA efforts offer a forum for the discussion of roles and responsibilities as well as an examination of enterprise business processes and requirements. According to survey results, the level of awareness of EA efforts is high among preservation agencies, but two-thirds of the survey respondents are not involved in the EA efforts of their state.

5. Findings and implications

5.1. Challenges to collaboration

Workshop attendees with different professional backgrounds expressed different concerns and interests regarding digital preservation (U.S. Library of Congress, October, 2005). Librarians, for example, 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 more interested in methods for information management and control, particularly system security. As for content types, librarians regarded electronic publications as most important, while archivists and records managers were most concerned with the preservation of public records.

The contrast between librarians/archivists and IT staff was particularly salient in the workshop discussions. The workshop
participants, mostly composed of librarians, archivists, and record managers, 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. They suggested a closer relationship between librarians/archivists and state CIOs, educating IT people on archivists and librarians’ work, and getting diverse 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 denoting the transfer information to a storage location containing infrequently used files, for example, from disk to tape (Bernbom, Lippincott, & Eaton, 1999).

The findings from the workshops appear consistent with the framework of Dawes and Prefontaine (2003) 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 protect collaboration from 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 1, UNESCO Guidelines for the Preservation of Digital Heritage (Webb, 2003) provides four structural models of collaboration for digital preservation. Among these models, the “centralized distributed model” can be regarded as the most relevant for digital preservation initiatives of state governments 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 records by providing funding and coordinating standards-setting processes. In this way participants can benefit from economies of scale in infrastructure investments, as well as diverse expertise and experiences. However, for the development of a community of practice for state government digital information, which will be discussed in the next section, the “more equally distributed model” might be more appropriate as the building and sustaining of communities of practice is an informal, voluntary, and self-organizing process.

5.2. Community of practice for digital preservation

Wenger’s (1998) theory of “community of practice” provides useful insights on why and how the digital preservation community should be established. Wenger, McDermott, and Snyder (2003) define communities of practice as “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.” According to these authors, communities of practice operate as

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“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 since 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 (Wenger and Snyder, 2000). According to Wenger (1998) 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 multiple membershipships who can introduce elements from one practice into another. The two are complementary in that boundary objects can overcome the physical limitation of participative connections, while 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 that it is necessary and possible to connect different communities and create 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, LC acted as a “broker” to gather librarian, archivist, and IT professionals together; to mobilize attention, and to provide coordination. This approach enabled participatory connections across communities of practice.

The creation of a state government digital information preservation community would allow utilization of expertise from different information professionals for successful digital preservation. For this purpose, it would be necessary to develop shared language and vocabulary in the forms of best practice and standards. Pan and Leidner (2003) reported that a lack of shared language and understanding across communities of practice, which exist between librarians, archivists, and IT professionals as described above, can cause dysfunction and divisions in communications.

Also, information and communication technologies can play an important role in the development and maintenance of the community of practice for the digital preservation of state government information. Pan and Leidner consider IT as “the linking mechanism of different communities of practice.” Internet technologies allow the members of different communities to gain access to new information, share expertise, and discuss ideas beyond geographical boundaries. As Wasiko, Faraj, and Teigland (2004) point out, voluntary participation is essential to the success of electronic networks because the collective knowledge generated by network members has the characteristics of a public good and may cause the problem of free-riding.

The NDIIPP state partnership initiative has actively utilized IT. From the data collected in the 2006 survey, CTG developed 67 web-based profiles of state library, archives, and records management units from 50 states and three territories, which became publicly accessible online in July 2006 (Center for Technology in Government, 2006). Developed by relational database software, the profiles provide detailed information on states’ capabilities and efforts concerning the preservation of their digital information. In response to the interests of the 2005 workshop participants, the profiles were developed to support states to exchange information with each other, identify potential partners, and initiate partnership efforts. Another example is “The Digital Preservation Network,” an online forum established in August 2006. Currently composed of members representing state libraries, archives, and records management units, the forum is dedicated to “forging a community of practitioners who are focused on the issues of preserving the digital records and publications of government” and will be “a repository for the exchange and discussion of ideas, research, strategy and documents that can be used by other practitioners in their organization.”

Snyder, Wenger, and Briggs (2003) 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, 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 2, and incorporated into the national digital preservation network.

5.3. Community building efforts

The NDIIPP initiative provided a great opportunity for digital preservation practitioners in state governments to initiate community building efforts. The workshop and survey processes were particularly conducive to collaboration and community development among participants. As shown in Figs. 1 and 2, both workshops and survey participants represented diverse groups of digital preservation professionals — librarians, archivists, records managers, and IT professionals. The workshop invitations requested that each state library and archives consult among 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 workshops. Each of the three workshops had a geographically diverse mix of states and territories in attendance and mainly consisted of small group sessions to which four to six state teams were assigned. The survey guidelines also encouraged collaborative responses among various agencies in state governments. As a result, 60% of survey responses were authored and submitted jointly by two or more units. The participants commented in workshop discussions that they wanted to “continue to establish the identity of this group, which is a unique blend of different communities” and “keep the conversation going.”

After the NDIIPP workshops and the survey, information professionals in state governments started to launch various efforts to develop a community of practice for preservation of state government digital information. As introduced above, the recently established online forum “Digital Preservation Network” aims to build a foundation for such a community via the exchange and discussion of information and ideas. Another example is the “Best Practice Exchange” series, which was hosted by the State Library of North Carolina in March 2006 and by the Arizona State Library, Archives, and

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* http://www.digitalpreservationnetwork.org
Public Records in May 2007. In this forum, librarians, archivists, records managers, and other information professionals shared their experiences and ideas in managing and preserving state government digital information through a series of facilitated exchange sessions. These efforts can be characterized as the “more equally distributed model” in the UNESCO collaboration framework as discussed above, since the partners have similar levels of commitment and responsibility, and no particular player assumes the leading role. This type of collaboration, which encourages shared level of ownership and does not require a central authority, is consistent with the development characteristics of a community of practice, while the NDIIPP initiative itself, as a more formal mechanism, has followed (so far) the “centralized distributed mode” (with LC acting as the leader and facilitator). Therefore the two models can be adopted in a complementary way to organize efforts for digital preservation of state government information, and the choice of a specific model will depend upon the purpose, nature, and progress level of a given specific preservation initiative.

6. Discussion

One of the basic themes emerging from the 2005 workshops and the 2006 survey was the need for collaboration between librarians, archivists, records managers, and IT staff to preserve the digital information of state governments. The findings show that these information professionals in state governments are willing to collaborate with one another, as partnerships present great opportunities for them, but that they face challenges including different interests and professional culture, a lack of common understanding of issues and values, and language barriers. In order to reconcile the different perspectives of information professionals, and to make full use of their expertise, a “state government digital information preservation community” can be established and incorporated into the national digital preservation network. The community, composed of librarians, archivists, records managers, 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. As discussed above, various efforts by information professionals in state governments are already underway to build a foundation for such a community of practice.

Some findings of the survey provide particularly useful insights for digital preservation partnerships within states. Survey results indicate that authority and responsibility for digital preservation-related standards-setting and digital preservation services are divided among a number of agencies/units within each state. This division of labor is one of the more challenging conditions in the environment. Its impact could be mitigated by building partnerships among state-level LARM units and those units located within legislative and judicial agencies. Building partnerships with those who share authority over the standards-setting processes and responsibility for providing digital preservation services appears well-advised. Also, other new intra-state partners should include the state IT department. Of note, ten states indicated in their survey responses that the equivalent of their state IT department (or a committee or commission formed by their state IT department) is a partner in the digital preservation activity they described. These and other efforts can serve as models for other states in building new relationships between and among state LARM units and state and agency level IT units.

For partnerships across states, and between states and federal government, the following recommendations can be made:

First: Establish more formal partnership structures between states in order to facilitate communication and protect collaboration and institutional legitimacy from political changes.

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: 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.

For more information about the 2006 exchange, see http://statelibrary.dcr.state.nc.us/digidocs/bestpractices/about.html. For more information about the 2007 exchange, see http://www.bpexchange.org/.
The baseline data and the state profiles introduced above can provide a wealth of data to support a range of uses by the digital preservation community. The data will have most value to the community, however, if used and improved upon in the development of partnerships, in making a case to agency leaders or elected officials for investments in digital preservation, and for creating new synergies and new knowledge within and across states about digital preservation challenges and opportunities.

As the findings from the workshops and survey suggest, inter-organizational 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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