Preserving State Government Digital Information
Minnesota Historical Society

NDIIPP Final Report
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Executive Summary

The Minnesota Historical Society began work on *A Model Technological and Social Architecture for the Preservation of State Government Digital Information* in 2008. Beginning with five state partners (Illinois, Kansas, Mississippi, Tennessee, and Vermont), the project eventually expanded to include Arkansas, Nebraska, and North Dakota. The project objective was to develop options for multi-state collaboration in accessing and preserving digital legislative data. Several lead partners helped us advance this work: the California Digital Library, the National Conference of State Legislatures, the California Legislative Counsel, and the Minnesota Office of the Revisor of Statutes. At the conclusion of the project in February

2012, we presented an array of options for managing digital legislative information in the context of a fluid technological environment and severely stressed state budgets.

Background to Project / Introduction

Participants in the Library of Congress Convening Workshops with the States in 2005 identified several issues common to government digital information. One concern was how to prevent the loss of digital content already "at-risk," particularly legislative records. A second concern was the lack of capability to develop and use collective resources to address common issues across the states.

The Minnesota project addressed both concerns. Building on previous work that the Minnesota Historical Society had undertaken with the California Legislative Counsel and the Minnesota Revisor's Office, the project team focused on a key lesson: that demonstrating immediate value in providing access to materials makes it easier to justify and build support for preservation activities. As project director Robert Horton explained, "Correctly designed, the architecture for collecting, sharing and providing access to digital content will better position repositories to preserve that content."

The project plan therefore articulated six objectives: 1) create a trustworthy technological and social architecture for capturing, managing, and providing access to legislative content from California and Minnesota; 2) test the capacity of other states to adopt that model; 3) analyze the results with the legislative and government records communities; 4) define the thresholds for participation to identify how different states could position themselves to implement similar programs; 5) use education and outreach to promote further collaboration and sustainability; and 6) develop compelling business cases for further investment.

Project Proposals

The initial project proposal for the Minnesota NDIIPP project was submitted in 2007 with the goal of addressing preservation and access of digital legislative materials. The plan was to propose both technical and social solutions for managing "at-risk" data across state borders.

In April 2009, project director Robert Horton requested an extension of the project to include several other components: 1) a pilot implementation in two states; 2) collaboration with the California Digital Library to test web archiving and a preservation repository; 3) evaluation and benchmarking process directed by Dr. Christopher A. Lee; 4) testing of the audio file repository developed by the Washington State Archives; 5) addition of up to four states to the partners' group; and 6) further outreach activities.

Full details are provided in the initial[1] and extension[2] proposals, both of which are available on the project website.

Course of Project Work

The project team acknowledged from the beginning of the project that work with digital legislative records would take place in a fluid environment with both developments in technology and state budgets significantly affecting the needs, interests, and capacities of our partners. Just how significantly this would affect the course of the project became clear in the fall of 2008 shortly after we began a round of visits to our partner states to discuss their requirements, infrastructure investments, and budgetary constraints. The severe economic downtown that began at that time impacted the resource environments of nearly all the states involved, including Minnesota. Indeed, two of our state partners, California and Illinois, faced some of the most significant budget shortfalls in the nation during the course of the project. These circumstances forced us to make adaptations to the project plan.

The most significant change was to move away from the creation of a repository model that we had planned to test with data from Minnesota and California and to focus instead on the other objectives. It became imperative that the project team understand the diminished capacities of the states in the context of preservation and access. Our challenge was to test solutions that could provide cost effective investments to allow states to meet their requirements and to provide resources to help legislative and IT staffs make informed decisions that would facilitate eventual multi-state collaboration. To that end, we abandoned the repository model and instead evaluated a series of solutions that included web archiving, cloud services, and XML databases. We examined the potential for third parties to develop mash-ups with legislative data if the information were exposed online in a consistent way. We also developed an XML schema and legislative metadata set to advance that consistent data description.

From the beginning of the project, it was apparent that the issues of authentication, preservation, and access of digital legislative records were a national concern. The Uniform Law Commission (then known as the National Conference of Commissioners on Uniform State Laws) first undertook a study of the issues and then drafted a model act for states to consider. The model act, titled "The Uniform Electronic Legal Materials Act" or UELMA, became the touchstone for our project and now forms the framework for discussion of these issues.[3]

The project's primary deliverable is the online resource center CAROL (Center for Archival Resources on Legislatures). The project team compiled white papers, consultant reports, and

[1] Initial Project Proposal, http://www.mnhs.org/preserve/records/legislativerecords/docs_pdfs/NDIIPP-MHS_Summary_000.pdf

[2] Extension Project Request, http://www.mnhs.org/preserve/records/legislativerecords/docs_pdfs/ExtensionSummary09102009_000.pdf

[3] A full discussion of the development of UELMA and its connection to this project can be found in a later section of this report.

external links in a framework designed to help managers of state legislative data make informed decisions about preservation and access of government data.

One of the key lessons from the Minnesota project is that regardless of cost, no single model for managing legislative data solves all the preservation problems that the states face. The various options presented in CAROL exist in an evolving technology environment, and the array of options available today will almost certainly become new solutions in the near future. We have discussed and collaboratively evaluated technology options for preserving information with the Minnesota Digital Library (MDL) throughout the course of the NDIIPP Project. The MDL staff agrees that in 2012 no one service model, partnership, or infrastructure investment can be singled out as the best moving forward. Both the NDIIPP project team and the MDL staff independently arrived at the conclusion that choices in this fluid situation might be clearer in the next couple of years.

Accordingly, one of the final activities of the NDIIPP project is to develop a partnership with MDL to create a dark archive repository service at the University of Minnesota to serve as a 24-month solution. We will store Minnesota legislative data on the MDL/UMN servers and develop a policy framework in the coming months for managing the information. This solution will serve as bridge between where we are now and where we hope to eventually be. It will allow us time to evaluate the options.

We will also continue work with the Minnesota Revisor's Office, developing the partnership that began under NDIIPP into an ongoing collaborative effort to create a dark archive and preservation framework for the Revisor's authenticated digital legislative content. This work will support UELMA requirements once the act is passed in Minnesota (expected by June 2012). This partnership may serve as a model for other states as they move to enactment of UELMA.

Conclusions and Lessons Learned

The Minnesota NDIIPP project began with the premise that those responsible for creating, delivering, and preserving state government digital information required a framework that promoted consistent data management practices and that facilitated multi-state collaboration. Our project methodology--ongoing communication and collaboration with our state partners--underscored our hypothesis that no single solution would answer the preservation needs of these diverse professionals. Instead, we focused on evaluating and testing a variety of solutions and researching the topics that our project partners highlighted as pressing concerns in their work.

Every one of our state partners was affected by the economic exigencies of the last several years, but not all to the same degree. We knew from previous projects that preservation in and of itself is a difficult concept to sell to legislative staffs in the best of times. In the aftermath of the 2008 economic collapse, it became even more critical to make a compelling business case for preservation. The project team focused on the business drivers for preservation (such as the

value of access over time) and on outreach efforts to convey the significance of this activity to key stakeholders.

Perhaps the most important lesson we learned in the course of the project was that the time has not yet come to advance a common information architecture and tool set for preserving and providing access to digital legislative content. Few of our partner states had the capacity to invest and participate in even a small prototype project. Instead, our project team approached the problem by developing an array of vetted options along with a web-based resource center to help information managers make the best choices for their unique situations. The Minnesota NDIIPP project took a non-custodial approach to managing information. We provided advice, tested options, wrote white papers that explored information management issues, and partnered with others to spread the results of our research and testing to as many interested parties as possible.

Our project recognized that preservation falls on a spectrum from simple storage to full preservation management supported by policies, standards, technologies, models, and partnerships. Our objective was to help our state partners identify their place on that spectrum. We aimed to connect them with resources that would inform their preservation activities in a practical and cost-effective manner building on their unique strengths. Some of the areas of focus included:

- Helping state librarians and archivists identify their needs and partner internally with legislative and IT staffs to develop solutions and policy frameworks.
- Identifying common requirements across state boundaries.
- Understanding the costs of preservation and helping record stewards understand benefits and tradeoffs.

Although we acknowledge that there is no perfect solution in 2012, we will continue to monitor the way technology is changing and we will stay engaged in the conversation. In the course of ongoing work in Minnesota with the Revisor's Office and with the Minnesota Digital Library, we will continue to evaluate the potential of cloud computing solutions, repository models, metadata developments, and policy initiatives. Some additional activities we will undertake in the coming months include:

- Supporting UELMA enactment in Minnesota in partnership with the Revisor's Office.
- Monitoring progress and emerging solutions that are specific to format types such as digital audio and video.
- Evaluating cost models for different types of solutions and infrastructure investments, particularly through ongoing work with the Minnesota Digital Library.
- Looking for and advancing solutions that have low barriers to entry, that are easy to develop and change, and that are cheap, simple, and effective.
- Continuing to share our activities with others and participating in discussions about digital issues through ongoing work with the National Digital Stewardship Alliance.
- Continuing to work as part of a community of users, and particularly to maintain contact with our state partners and others in our project network.

Project Activities

The project work centered on creating useful information for legislative staff, archivists, librarians, and others with an interest in digital government records. Activities included the development and maintenance of the project website and creation of the Center for Archival Resources On Legislatures (CAROL) Resource Center; communications with partners; development and nurturing of partnerships; and research, education and outreach on topics of interest. Specific areas of focus are discussed in detail below.

Project Website and Resource Center

A website[4] was developed at the start of the project to document activities and share information developed in the course of our research and testing work. The website was updated regularly with new materials as they became available. This material included white papers, meeting summaries, presentations, and other project related information. All material was vetted by appropriate partners before being posted, allowing for input from multiple sources.

The Center for Archival Resources On Legislatures (CAROL)[5] was created at the end of the project. CAROL organizes Minnesota's NDIIPP project activities and products into four topical areas: Foundations, Access, Authentication, and Preservation. A sitemap of CAROL is provided in Appendix F.

Partner Interactions

Many methods were used to interact with project partners, including the use of online tools, phone calls, and face-to-face meetings.

BaseCamp

General communications that involved all partners or select groups of participants took place via messages within BaseCamp, an online project management tool. The project team created eight different sites on BaseCamp. One site was for all partners while others were created for specific purposes such as the XML Schema Working Group or the Tessella SDB Pilot Project Group. These BaseCamp sites will be discontinued on March 31, 2012 although full XML backups of the message threads will be created and preserved.

Meetings

The project team organized three "all partner" meetings during the course of the project. These large meetings allowed the team to share information, gather feedback, and initiate discussion on issues of interest to all participating states. The meetings also allowed state

[4] Minnesota NDIIPP Project home page, http://www.mnhs.org/ndiipp
[5] CAROL home page, http://www.mnhs.org/preserve/records/legislativerecords/carol/index.htm

partners to meet one another and create contacts of like-minded professionals across the country.

Site Visits
Project team members visited each state at least once, organizing on-site meetings to both collaborate with partner staff on project objectives and to encourage internal cooperation between legislative staff, archivists, librarians, IT staff, and other representatives from relevant state agencies and organizations. Dates and locations for these site visits are provided in Appendix C. Additional meetings took place with partners involved with specific activities, such as development of the XML schema and testing access/preservation solutions.

Phone Calls
When appropriate, conference and one-on-one calls were set up to discuss specific project topics between involved parties. For example, the project team participated in conference calls with staff at the California Digital Library (CDL) at least twice a month while testing the Web Archiving Service (WAS) and Merritt, CDL's preservation repository. Similar but more frequent calls facilitated the testing of both eXist and Tessella's Safety Deposit Box (SDB).

Training Sessions
Training sessions were organized and carried out in both Minnesota and partner states during the implementation of the pilot projects, specifically with eXist (in Minnesota only) and with Tessella's SDB (in Minnesota, Tennessee, and Vermont). These sessions provided attendees with hands-on experience with systems and face-to-face contact with vendor representatives who could assist them during testing and evaluation.

Partnerships and Collaboration

The interactions with state partners through site visits and project activities were an opportunity to create partnerships, networks, and collaboration opportunities within a larger community of information professionals. During state site visits, project staff facilitated conversations between representatives from different state agencies. In some cases these meetings were the first time people with similar goals but in different work units came together to talk about preservation and access topics. Follow-up state visits advanced these conversations and introduced state partners to updated project information.

In addition to promoting inter-agency collaboration during state visits, the project team also worked with organizations such as the National Conference of State Legislatures (NCSL), the National Association of Legislative Information Technology (NALIT, a sub-group of NCSL), and Thomson-Reuters on specific projects and outreach activities. NCSL staff started a website for its members that drew on project information, contracted with the project team to create and publish a brochure on preservation of digital legislative materials, and invited project partners to present on relevant topics at NCSL

and NALIT conferences. Thompson-Reuters staff played a key role in the development of the XML schema and legislative metadata set. Each opportunity to work with organizations such as these increased the visibility of the project, garnered expert input from non-state government sources, and created an ongoing network of professionals concerned with digital legislative materials.

Education and Outreach

Throughout the course of the project, educating project partners and others with similar interests was a main focus. Project staff participated in many professional and topical conferences, gave presentations, and developed additional outreach opportunities by publishing in various media formats.

Highlights include: a project podcast; a project bookmark (which prompted the Library of Congress to create bookmarks for each state partner involved in a NDIIPP project); and a sixteen-page brochure on digital preservation of legislative records published by the NCSL with assistance from the project team.

A list of these educational materials, conferences, and presentations can be found in Appendix D.

Research and White Papers

Some white paper topics were identified at the outset of the project while others were the result of conversations with state partners. In addition to the white papers listed below, information on specific project activities can be found in the Special Topics section of this report.

Access / Open Data:

Finding ways to better provide access to digital legislative materials was a primary goal of the project.

- Web Content Accessibility (ADA) (2008; December 2010)
- Options for Improving Access to Legislative Records (June 2009)
- Best Practice Principles for Opening Up Government Information (March 2011)
- Mashups Using Government Data (January 2009)

Authentication:

Authentication emerged early in the project as a key area of current work and one of considerable interest to our project partners. Our partners expressed concern about the trustworthiness of online state statutes, session laws, and other legislative materials. These issues were addressed in three white papers covering the basics of authentication, authentication methods, and associated costs. The project team also followed the

development of the Uniform Electronic Legal Materials Act (UELMA), a model act specifically concerned with the authentication, preservation, and access to online legislative materials (see later section on UELMA for more details).

- Authentication of State Online Primary Legal Materials (July 2008)
- Authentication Methods (January 2011)
- Authentication of Primary Legal Materials and Pricing Options (December 2011)

The Business Case for Digital Preservation:
When preservation is seen as merely an additional mandate on top of other imperatives, it is unlikely that policy makers will make it a priority. If, on the other hand, it is understood to be an investment that ultimately saves time and money, it is more likely to be seen by all stakeholders as a worthwhile activity.

- Developing a Business Case for Digital Preservation (October 2011)

Cloud Computing:
Over the last few years, cloud services have gained considerable traction as a storage option for government information.

- Cloud Computing: An Introduction (August 2011)

Formats and Standards:
The use of widely used formats and standards facilitates information access and sharing and helps with the process of preserving records over the long term.

Audio and Video: Many states utilize digital audio and video to offer online access to legislative floor sessions and committee meetings. These sessions are often streamed live as well as archived for a certain period of time. In 2009, project staff surveyed the states' use of digital audio and video for legislative purposes. The project team found very little consistency across state lines in the use of formats.

- Survey of State Use of Digital audio and video (February 2009)
- Digital Audio and Video Paper and Resource List (May 2009)

Metadata: The XML Schema Working Group defined a set of metadata elements that can be used to describe legislative records. This metadata set, although created to describe the often complex components of bill and statutes, is

streamlined and basic, following the premise that having fewer required elements will make it easier for the schema to be widely used.

A report was written comparing the NDIIPP legislative metadata set and the legislative metadata the Sunlight Foundation uses to facilitate use and access in their projects.

- Legislative Metadata Comparison (MHS/Sunlight) (March 2011)
- Legislative Metadata Set (August 2011)

Retrospective Digitization: Many of our partners expressed an interest in digitizing older materials in their care.

- Retrospective Digitization paper and resources (March 2009)

XML: XML is widely used in legislative bill drafting systems. NCSL noted the trend of more states moving to XML as they retool or replace their bill drafting systems. Information on such XML usage was compiled in 2009.

In 2009-2010, the project team tested an access architecture based on native XML database technology. (More information on the system and testing can be found under the eXist Pilot Project, a subset of the Special Topics section of this report.)

- XML Usage Survey; Comparison Chart of State Use of XML Bill Drafting Systems (February 2009)
- Native XML Databases and Legislative Documents (December 2009)

Legislative History:
State partners stressed the importance of not only knowing how to preserve legislative materials but also making the public aware of how to find and use available records.

- Legislative History: Information and Instructions (Minnesota specific) (January 2009)

Preservation:
Preservation of digital legislative materials was a main focus of the project. Project staff developed a number of topical white papers, which are offered in the Center for Archival Resources On Legislatures (CAROL).

- Preservation Options Grid (April 2009)
- Needs Assessment (February 2012)

- Components of Preservation (February 2012)
- Developing a Preservation Plan (February 2012)
- Choosing a Preservation System (February 2012)
- Preservation Models (February 2012)

Record Inventory and Retention:
Conducting a record inventory and understanding record retention policies facilitate access and planning for preservation. Project staff produced three documents relating to these topics.

- Record Retention Policies for Selected Legislative Records (September 2008)
- Survey of Partner's Legislative Records on the Web (December 2008)
- Record Inventory Project: Identifying and Preserving Minnesota's Digital Legislative records (December 2011)

Web Archiving:
Web archiving is one option for preservation of and access to online materials. The project team tested and evaluated two specific services.

- Web Archive Evaluations (October 2009)
- Web Archiving: General Introduction with WAS Case Study (November 2010)

Special Topics

In addition to the general project activities, the project identified and followed several specific topics.

Uniform Electronic Legal Materials Act (UELMA)

The emphasis of the Minnesota project on the preservation of and access to digital legislative records led the project team to investigate the topic of authentication of digital materials. In July 2008, the project team issued a white paper on authentication that framed the issue, provided the legal context, and pointed to selected initiatives and resources. Concurrently, the Uniform Law Commission (ULC, then known as the National Conference of Commissioners on Uniform State Laws) moved forward with a "Study Committee on Authentication of Online State Legal Materials."[6] Both the Council of State Archivists and the Society of American Archivists were identified as "interested organizations," and both designated Robert Horton as their official observer.[7]

[6] ULC Committees Electronic Legal Materials Act home page, "Study Committee Report (4/30/09)" at http://www.uniformlaws.org/Committee.aspx?title=Electronic%20Legal%20Material%20Act
[7] Observers were not members of the committee, but were allowed to offer input during discussions.

The committee presented its report to the ULC in April 2009, calling for a "drafting committee to prepare a draft uniform law describing the minimum standards for the authentication and preservation of online state legal materials." The report went on to state that

> "…there is a high need for the public, lawyers, and judges to have access to accurate material. For many years, print versions of these documents have served as prima facie evidence of the originals. As the official publishers of these materials begin to discontinue print, there is a need to identify the steps necessary to make sure that the online versions of these documents have a similar level of reliability and accuracy. In addition, the emerging prevalence of online legal materials raises the issue of how the online versions can be made accessible into the long-term future." [8]

Three participants in the Minnesota NDIIP project played key roles in the drafting committee's work. Michele Timmons, the Minnesota Revisor of Statutes, chaired the committee; Diane Boyer-Vine, the California Legislative Counsel, served as a member; and Robert Horton continued as an observer. Both Timmons and Horton communicated regularly with the project team about deliberations and progress.

In January 2010, the committee produced a first draft of the model law, then titled "Authentication and Preservation of State Electronic Legal Materials Act." The draft defined "authenticate" to mean "to verify that the content of a document is complete and unaltered from the version published by the official publisher." Horton reported to the NDIIPP team that some committee members advocated a prescriptive approach specifying certain practices and technologies such as digital signatures, and the committee initially leaned this way. Section 4 of the draft document specified that

> "At a minimum, authentication must include: (A) certification that establishes a chain of custody for the document from its official publication to the computer system in which it is stored permanently; and (B) protection of the transmission of the document by security measures designed to prevent corruption of or tampering with the document from the computer system in which it is stored permanently to the computer system of the user." Furthermore, "An authenticated electronic document must display clearly an indicator of its authenticity."[9]

The draft was just as specific when it came to preservation:

[8] ULC Committees Electronic Legal Materials Act home page, "Study Committee Report (4/30/09)" at http://www.uniformlaws.org/Committee.aspx?title=Electronic%20Legal%20Material%20Act
[9] ULC Committees Electronic Legal Materials Act home page, "December 2009 Redline Draft" at http://www.uniformlaws.org/Committee.aspx?title=Electronic%20Legal%20Material%20Act

> "At a minimum, preservation must include: (A) documentation of the data format used in the original document creation; (B) periodic archiving of the data, in paper or electronic form or both; and (C) periodic updating of the document in new electronic formats, as necessary to provide continuing permanent public access to the document."[10]

The drafting committee continued to work throughout 2010 and into 2011, issuing numerous revisions as members tried to reach a consensus on the content of the act. By June 2010, however, the committee had reached two important decisions. First, at the urging of several observers, members agreed that the act should be "technology neutral" with regards to authentication, meaning that the act would "express the desired outcomes of the technology, and leave the method of achieving the outcomes to the states."[11] Second, the committee moved to an outcome-based approach for preservation as well as authentication.

The move to an outcome-based approach echoed the trends the NDIIPP project team was identifying through work with project partners:

1. Each state is unique in its practices, policies, capacities, and resources.
2. Technological infrastructure varies from state to state.
3. Technology is dynamic and will inevitably change over time.
4. States generally have limited money and enthusiasm for investing in a prescribed set of new technologies and practices, and they require flexibility to work within their budgets and capacities. (This has been particularly true since the economic downturn in late 2008.)

The drafting committee presented its final version of the act to the ULC membership for its approval at the organization's July 2011 annual meeting. The act, which had been re-titled the "Uniform Electronic Legal Materials Act" (UELMA), concisely places online legal materials on the same trustworthy level as materials traditionally published in book form, all the while remaining technology-neutral.[12]

Section 5 addresses the process of authentication in one sentence: "To authenticate an electronic record, the publisher shall provide a method for a user to determine that the record received by the user from the publisher is unaltered from the official record published by the publisher." Section 7 requires the preservation of official electronic records in electronic or other form, stating only that "If legal material is preserved in an electronic record, the official publisher shall: (1) ensure the integrity of the record; (2) provide for backup and disaster recovery of the record; and (3) ensure the continuing

[10] Ibid.
[11] ULC Committees Electronic Legal Materials Act home page, "Issues Memo for 2010 Annual Meeting Draft" at http://www.uniformlaws.org/Committee.aspx?title=Electronic%20Legal%20Material%20Act
[12] ULC Acts Electronic Legal Materials Act home page, "Final Act 2011" at http://www.uniformlaws.org/Committee.aspx?title=Electronic%20Legal%20Material%20Act

usability of the material." Section 8 requires that the records preserved under Section 7 are "reasonably available for use by the public on a permanent basis."

In a nod to those who advocated the prescriptive approach, the act includes a section on standards, which only requires that the official publisher consider standards, practices, methods, and technologies used by other jurisdictions and states, as well as those recommended by national standard-setting organizations.

The practical effect of UELMA is that each enacting state has the flexibility to meet the authenticity, preservation, and access requirements within its own policy, budgetary, and technological frameworks, responding as it sees appropriate to emerging and new standards. UELMA also has the potential to break down jurisdictional boundaries in that if a state enacts UELMA, its authenticated legal materials are considered authentic in other enacting states. Ultimately, the public will benefit from increased online access to authenticated legislative materials.

With the ULC's approval of UELMA, states may opt to move to enactment. To support the requirements of enactment, states must identify user needs, select appropriate and affordable technology solutions, and create plans for preservation and access into the future. As of early 2012, five states are formally moving to enactment – Minnesota, California, Tennessee, Colorado, and Rhode Island.[13] (California and Tennessee were partner states in the Minnesota project.) In preparation for enactment in Minnesota, the Revisor of Statutes is currently directing changes to support authentication to the website that provides online access to the state's digital legislative materials. The Revisor's office will also be working with the Minnesota State Archives to establish a long-term partnership for archival preservation of legislative materials to support the UELMA requirements.

Although it could not have been predicted at the beginning of the Minnesota NDIIPP project, the development of UELMA mirrored and reinforced the findings of the project team. In its final form, UELMA has become the framework for considering all issues relating to the preservation of and access to digital legislative materials.

XML Wrapper and Legislative Metadata Set

After initial conversations with Minnesota partners, the project team met with representatives from the Minnesota Office of the Revisor of Statutes, XMaLpha Technologies, and Thomson Reuters to begin developing an XML schema for state legislative content. The XML Schema Working Group met on an occasional basis from June 2008 through September 2010, using BaseCamp to share files and ideas over the course of the development work.

[13] ULC Acts Electronic Legal Materials Act home page, Legislative Tracking at http://www.uniformlaws.org/Committee.aspx?title=Electronic%20Legal%20Material%20Act

At the first meeting, participants discussed the feasibility of creating an XML schema but abandoned the approach as being too difficult to develop and maintain. The group next turned to creating an XML wrapper for legislative information exchange, which could contain legislative data in a multiple formats (such as Word, XML, and PDF) as well as a defined set of metadata, which the group selected and defined.

The working group developed two products: a legislative metadata set and an XML wrapper that can be used to bundle and document bill files. These were shared with project partners and used in a variety of ways from 2010 through 2011. Staff at the California Legislative Counsel used the schema and wrapper to associate metadata with recently digitized California bill files. The metadata and wrapper were also used while testing ingest, search, and preservation functions of Tessella's Safety Deposit Box. Minnesota Revisor's Office staff tested the wrapper and metadata, and made plans to put each to routine use.

More information on the XML wrapper and metadata set can be found on the XML Schema Working Group's page of the project website. [14]

California Legislative Counsel Work

The California Legislative Counsel (CLC) was one of the project's lead partners, providing frequent input and working closely with the project team. The CLC also hosted the 2010 all-partner meeting in Sacramento.

One of the projects that the CLC worked on was testing the adaptability of the legislative metadata set and XML wrappers that the XML Schema work group created. California reviewed both products, made a few minor suggestions to make them more flexible, and then used them with newly digitized California legislative content (dated 1886-2009). In addition to documenting their experience using the wrapper and metadata set, they also documented the entire digitization process (another topic of interest of partners). CLC staff worked on these activities from February 2010 through December 2011.[15]

Diane Boyer-Vine, Legislative Counsel of California, was on the drafting committee for UELMA and was interested in learning more about authentication methods and associated costs so that she and her staff could understand their options. To learn more, CLC started working with a consultant in September 2011 to explore these topics. Initial ideas were presented at a meeting at the Library of Congress in November 2011, and a white paper was published by the CLC the following month.

[14] XML Schema Working Group page, http://www.mnhs.org/preserve/records/legislativerecords/xml1.htm and Metadata Schema page, http://www.mnhs.org/preserve/records/legislativerecords/xml1.htm

[15] http://www.mnhs.org/preserve/records/legislativerecords/docs_pdfs/CA_Authentication_White Paper_Dec2011.pdf

Legislative Record Inventory

Working with the Minnesota Legislative Reference Library, the project team created an inventory of Minnesota legislative records with long-term value. The inventory identifies what is available, formats (paper and digital), and who is responsible for the long-term care of specific record sets. The Legislative Reference Library is now in control of the inventory and will continue to use and update it.

More information on the Legislative Record Inventory project can be found on the project website.[16]

Exploring Access and Preservation Solutions

Understanding that there is no one-size-fits-all solution to access and preservation, the project tested and evaluated a variety of systems. Each test case was documented, and the evaluation details were made available on the project website.

eXist

The project team worked with a vendor, Syntactica, to develop a system based on native XML database technology. After discussing system requirements with the team, Syntactica developed proof-of-concept applications using eXist, an open-source native XML database. XML data from California, Illinois, and Minnesota was used for testing. The system was designed to allow users to access state-specific data as well as search across all the states' data. System functionality for ingest, search, and export were tested.

The pilot project commenced in August 2009, and a prototype was demonstrated at the January 2010 all-partners meeting. During the evaluation phase, the project team found that although the access functionality worked well for XML files, there was uncertainty and concern about how well information in other formats, particularly PDF, would be handled. As a result of this critical gap, a second phase of the pilot was deemed not useful. The final report, evaluation, meeting summaries, and additional information can be found on the project web page.[17]

KEEP

The Kansas State Historical Society worked on the Kansas Enterprise Electronic Preservation (KEEP) System Project. Financial assistance provided by the Minnesota NDIIPP project supported policy framework and prototype development work as well as the development of the "KLISS to KEEP Connector."

[16] Legislative Inventory project, http://www.mnhs.org/preserve/records/legislativerecords/RecordInventory.htm
[17] eXist Pilot Project page, http://www.mnhs.org/preserve/records/legislativerecords/pilot.htm

KEEP is designed to provide an enterprise-wide, trustworthy digital repository for Kansas government records with long-term value. The digital repository will provide public access to authentic records to support e-Democracy, accountability, and transparency in government. It is expected that the first ingest of legislative materials will occur in early 2012, with public access following later in the year.

KEEP will be connected to the Kansas Legislative Information System (KLISS) with a "KLISS to KEEP Connector." The connector, which is expected to go live in 2012, will assist with preserving and promoting access to real-time activities of legislative development.

Details about this project can be found in Appendix E as well as in Dr. Lee's evaluation report.

Merritt

The project team worked with the University of California Curation Center (UC3), a unit of the California Digital Library (CDL). UC3 staff designed and built Merritt, a preservation and access repository based on micro-services. The team tested Merritt (including ingest, versioning, and object retrieval) over the course of a year and provided UC3 with feedback on how the system worked with legislative materials and non-University users.

The final report describes the testing experience as well as issues to consider when exploring preservation options in general.[18]

OpenGovernment Website

The Minnesota NDIIPP project contracted with Sunlight Labs to create an online access point for Minnesota legislative materials within Sunlight's OpenGovernment model. An initial meeting with Sunlight to define the scope of work was followed by conference calls and email communication to create a detailed work plan and to specify deliverables. Sunlight worked on the Minnesota page from December 2010 through June 2011.

This access solution demonstrates possible online uses of digital legislative data compiled from various sources. Sunlight used a template created for other states to build the Minnesota page and produced a document discussing common barriers to gaining access to legislative information. They also provided

[18] Merritt Testing, http://www.mnhs.org/preserve/records/legislativerecords/docs_pdfs/MerrittTesting2011.pdf

suggestions for creating legislative data that would be easier to repurpose.[19] The OpenGovernment site can be found online.[20]

OpenStates Mobile App

MHS contracted with Sunlight Labs to create a mobile application called Open States.[21] Sunlight worked on this app from September 2011 through January 2012. Sunlight used data from their OpenStates project to create the mobile application for the Apple iOS system, which is available through the iTunes Store. At the conclusion of the work, Sunlight submitted a report documenting the process.[22]

Tessella's Safety Deposit Box (SDB)

Minnesota and three state partners (Illinois, Tennessee, and Vermont) tested Tessella's commercial digital preservation system, the Safety Deposit Box (SDB). Each state had its own instance but shared storage space and underlying functionality (an arrangement known as "multi-tenancy"). SDB is a powerful preservation system because it offers preservation repository functions as well as tools to migrate files from one format to another.

The project ran from April through September 2011. The work started with a kick-off meeting for state testers, followed by on-site training sessions, and finishing with a final group meeting. Training sessions included discussions on functionality and processes as well as customizations and testing preferences. After customizations were made by Tessella for each participating state, partners tested the SDB with their own data, focusing on features they found most useful. Additional customizations were made as need arose and resources permitted.

Final reports, meeting summaries, and additional information documenting the project can be found on the project web page.[23]

Washington Digital Archives

The Washington Digital Archives was the lead partner on another state NDIIPP project. The Minnesota project team became interested in one of the features of their digital archive, namely the ability to search archived digital audio content. The Minnesota project team investigated requirements and determined that the

[19] Sunlight, http://www.mnhs.org/preserve/records/legislativerecords/sunlight.htm
[20] OpenGovernment Site, http://opengovernment.org/home
[21] Apple iTunes Store, "Open States" app, http://itunes.apple.com/us/app/open-states/id500672932?mt=8
[22] Sunlight, http://www.mnhs.org/preserve/records/legislativerecords/sunlight.htm
[23] Tessella Pilot Project page, http://www.mnhs.org/preserve/records/legislativerecords/Tessella.htm

Tennessee State Library and Archives (TSLA) was the best partner to pursue a testing relationship with Washington.

After testing, TSLA submitted a report detailing their experiences with the Washington project. TSLA found that the technical requirements for use of the system were too demanding; all of their digital audio files would have to be migrated into a new format in order to be compatible with the system. The TSLA testing took place between April 2010 and September 2011. As of January 2012, the files Tennessee ingested into the Tennessee Digital Archives could be accessed online. [24]

Web Archiving Service and Archive-It

As more material is made available online, web harvesting and archiving are emerging as possible preservation options. The project team tested two web archiving systems, Archive-It and UC3's Web Archiving Service (WAS), documenting processes, findings, and issues related to web archiving.

MHS staff previously tested Archive-It in 2007 for other purposes. The project team took a fresh look at updated system in January and February 2009. Testing of the WAS took place in March 2009 and again during the period March through November 2010.

Reports and additional information can be found on the web archiving page of the project website. [25]

NDIIPP Project Evaluation

Dr. Christopher (Cal) Lee was asked by MHS to consult the Minnesota NDIIPP project. He followed activities and gave input as requested.

In early 2010, Dr. Lee completed an evaluation of the eXist pilot project. [26] After this evaluation, Dr. Lee was scheduled to begin additional work for the project team. However, at the request of the Library of Congress, the plan was changed to a broader evaluation of all the state NDIIPP projects.[27]

[24] Tennessee Digital Archives home page, http://www.tennesseedigitalarchives.org/default.aspx
[25] Web Archiving, http://www.mnhs.org/preserve/records/legislativerecords/WebArchiving.htm
[26] http://www.mnhs.org/preserve/records/legislativerecords/pilot.htm
[27] As of February 29, 2012, Dr. Lee's report has not been finalized and is not publically available.

Appendices

Appendix A:
Minnesota Project Staff

Appendix B:
State Partners, Other Organizations, and Vendors

Appendix C:
Partner Meetings

Appendix D:
Conferences, Presentations, Outreach

Appendix E:
Kansas Enterprise Electronic Preservation (KEEP) System

Appendix F:
Center for Archival Resources On Legislatures (CAROL) site map

Appendix A: Project Staff

The following is a list individuals who participated in the NDIIPP project in association with the Minnesota Historical Society.

- Robert Horton, Project Director (2008 through October 2011)
- Jennifer Jones, Project Manager; Project Director (November 2011 through February 2012)
- Shawn Rounds
- Carol Kussmann
- Charles Rodgers
- Nancy Hoffman
- Chris Welter
- Shelby Edwards
- Dr. Christopher A. Lee (consultant)

Appendix B: State Partners, Other Organizations, and Vendors

The following is a list of state partner agencies and other organizations that MHS worked with over the course of the project. Agencies and organizations that marginally participated are not included.

State Partners

- Minnesota
  - Minnesota Office of the Revisor of Statutes
  - Minnesota Legislative Reference Library

- California
  - California Legislative Counsel
  - California Digital Library (CDL), University of California Curation Center (UC3)
  - California State Archives
  - California State Library

- Kansas
  - Kansas State Historical Society
  - Kansas Legislative Administrative Services
  - Kansas Legislative Computer Services

- Illinois
  - Illinois State Library
  - Illinois State Archives

- Tennessee
  - Tennessee State Library and Archives
  - Tennessee Legislative Information Services

- Vermont
  - Vermont State Archives and Records Administration
  - Vermont State Department of Information and Innovation
  - Vermont Department of Libraries
  - Vermont Enterprise Project Management Office
  - Vermont Joint Fiscal Office
  - Vermont Legislative Counsel
  - Vermont State Chief Information Office

- Arkansas
  - Arkansas History Commission
  - Arkansas State Library

    - Arkansas Bureau of Legislative Research

- North Dakota
    - North Dakota State Historical Society
    - North Dakota Legislative Council
    - North Dakota Information Technology Department

- Nebraska
    - Nebraska State Historical Society
    - Nebraska Library Commission
    - Nebraska State Library
    - Nebraska's Clerk of the Legislature

- Mississippi
    - Mississippi Department of Library and Archives
    - Mississippi Legislative Budget Office

Other Organizations (including vendors)

- National Conference of State Legislatures (NCSL)
- National Association of Legislative Information Technology (NALIT)
- Minnesota Digital Library (MDL)
- Thomson-Reuters
- Tessella
- Sunlight Foundation/Labs
- Archive-It
- Propylon
- XMaLpha Technologies
- Syntactica

Appendix C: Partner Meetings

The following is a list of the major state partner and all-partner meetings held throughout the project. This list does not include working group meetings, conference calls, or other interactions.

- Project Kick-Off Meeting
  - January 2008; St. Paul, MN

- All-Partners Meetings
  - December 2008; St. Paul, MN
  - January 2010; Sacramento, CA
  - December 2011; St. Paul, MN

- New Partners Meeting
  - August 2009; St. Paul, MN

- Arkansas
  - October 2010; Little Rock, AR

- California
  - March 2008; Sacramento, CA
  - June 2009; Sacramento, CA

- Illinois
  - February 2008; Springfield, IL
  - August 2009; Springfield, IL

- Kansas
  - March 2008; Topeka, KS

- Minnesota
  - February 2008; St. Paul, MN
  - September 2010; St. Paul, MN
  - June 2011; St. Paul, MN

- Mississippi
  - May 2008; Jackson, MS
  - May 2009; Jackson, MS

- Nebraska
  - December 2009; Lincoln, NE

- North Dakota
    - April 2010; Bismarck, ND

- Tennessee
    - August 2008; Nashville, TN
    - July 2009; Nashville, TN

- Vermont
    - April 2008; Montpelier, VT
    - May 2009; Montpelier, VT

Appendix D: Conferences, Presentations, Outreach

The following is a list of publications and presentations that the project participated in throughout the course of the project. The list highlights main activities and is not exhaustive.

Publications/Outreach
In addition to creating bookmarks, brochures, and a podcast[28] for the project, the project team worked with the National Conference of State Legislatures (NCSL) to publicize issues related to the digital preservation of legislative materials. NCSL created a sixteen-page brochure, *Preserving Legislative Digital Records*[29] and a webpage[30] with the same title. NCSL also posted pertinent information on its blog, "The Thicket."[31]

Members of the XML Schema Working Group published an article in NCSL's National Association of Legislative Information Technology (NALIT) Newsletter in January 2010, "An XMLWrapper for the Exchange and Archive of Legislative Bills." NCSL's Legal Services Staff Section Newsletter published an update on ULEMA in July 2011.

Conferences/Presentations
Team members attended and participated in multiple conferences, including:

- April 2008: NCSL Spring Forum; Washington, D.C.
  - Legislative Records in the Digital Age
- May 2008: Temple University State Politics and Policy Conference; Philadelphia, PA
- July 2008: NDIIPP Partners Meeting; Washington, D.C.
- July 2008: NCSL Legislative Summit; New Orleans, LA
  - Protecting Legislative Digital Records
- August 2008: SAA; San Francisco, CA
  - State NDIIPP projects
- April 2009: NCSL Spring Forum; Washington, D.C.
  - Digital Archiving of Legislative Information
- June 2009: NDIIPP Partners Meeting; Washington, D.C.
  - Metadata and Minnesota's Legislative Documents
- July 2009: NAGARA; Seattle, WA
  - Preserving State Digital Legislative Records
- August 2009: CoSA-SAA Joint Annual Conference; Austin, TX

[28] Podcast, http://discussions.mnhs.org/collections/2009/10/good-government-through-digital-infrastructure-and-preservation/
[29] NCSL Brochure (*Preserving Legislative Digital Records*), http://www.ncsl.org/issues-research/telecommunications-information-technology/preserving-legislative-digital-records.aspx
[30] NCSL web page, http://www.ncsl.org/issues-research/telecommunications-information-technology/preserving-legislative-digital-records-resources.aspx

- October 2009: NCSL Legislative Research Librarians Professional Development Seminar; Saint Paul, MN
    - Project Background: Preserving Legislative Digital Records
- April 2010: NCSL Spring Forum; Washington, D.C.
    - Preserving Our Legislative Legacies
- July 2010: NDIIPP Partners Meeting; Washington, D.C.
    - Preserving Legislative Digital Records
- July 2010: NCSL Legislative Summit; Louisville, KY
    - XML Standards for Archiving Legislative Records
    - Protecting Legislative Records in the Digital Age
- August 2010: SAA/NAGARA/CoSA Annual Conferences; Washington, D.C.
- September 2010: Best Practice Exchange (BPE); Phoenix, AZ
    - NDIIPP Projects sponsored meeting
- October 2010: NCSL / American Society of Legislative Clerks and Secretaries Professional Development Seminar; Milwaukee, WI
    - It's Not Easy being Green: The Benefits and Pitfalls of 'Greening' Your Legislature
- April 2011: NAGARA Electronic Records Forum; Austin, TX
- June 2011: The State of the Digital Nation; Washington, D.C.
    - Preserving State Government Information (Recorded by LoC)
- July 2011: CoSA-NAGARA Annual Meeting; Nashville, TN
- July 2011: NDIIPP/NDSA Partners Meeting; Washington, D.C.
    - Tessella / SDB Poster session
    - Project update
- August 2011: NCSL Legislative Summit; San Antonio, TX
    - Open and Accessible Legislative Records
- August 2011: SAA Annual Conference; Chicago, IL
- October 2011: Best Practices Exchange (BPE); Lexington, KY
    - Overview and evaluation
    - Inventory Project: Identifying and Preserving Minnesota's Digital Legislative Record

Appendix E: Kansas Enterprise Electronic Preservation (KEEP) System

This section is provided by KSHS staff

What is KEEP?

Preservation of electronic government records with enduring value is one of the most challenging issues impacting government accountability and transparency in the 21st century. The Kansas Enterprise Electronic Preservation (KEEP) System Project will provide an enterprise-wide, trustworthy, digital repository for Kansas government electronic records with long-term value. The digital repository will provide public access to authentic records to support e-Democracy, accountability and transparency in government. KEEP will provide certification of authenticity for specific record sets on a fee basis. The KEEP System will be built on the international standard for trustworthy digital repositories, the Open Archival Information System (ISO 14721:2003). Other relevant standards such as the Trustworthy Repositories Audit & Certification: Criteria and Checklist (TRAC) will guide KEEP System development. The project team will make every effort to design and build the repository with open source tools.

The partnership for the prototype KEEP System Project is unique because it includes all three branches of Kansas state government cooperating to develop an enterprise-wide solution. The KEEP team includes subject matter and technical experts from the Kansas State Historical Society, the Kansas Legislature, the Kansas Judicial Branch, the Attorney General's Office, and the Division of Information Systems and Communications (DISC). The first records ingested into the system will be the foundational documents for interpreting Kansas law — committee hearings from the Legislature, Supreme Court opinions and Attorney General's opinions. The prototype will integrate with the Kansas Legislative Information Systems and Services (KLISS) which is under development.

Why KEEP?

Over the past twenty years, digital technology has transformed the way organizations create, use, store, and disseminate information. Effective management of government records in electronic format is a critical and challenging issue for records preservation in Kansas. The Kansas State Historical Society (KSHS), through the Government Records Preservation Act (K.S.A. 45-401 through 45-413), has statutory responsibility to serve as the official archives for the state of Kansas and to undertake records management activities. All state agencies are also subject to this law. Since 1996, the KSHS has engaged in several initiatives to promote electronic records management and preservation best practices in Kansas government. The 2010 Kansas Legislature passed and the Governor signed into law House Bill 2195: An act concerning state records; relating to maintenance and certification of electronic records. This law authorizes the State Archivist to recommend to the State Records Board standards for preserving and maintaining the authenticity of electronic government records. The statute also states that records preserved in accordance with those standards and certified by the State Archivist will have full legal status. This law provides the necessary statutory foundation to support the transition to a digital archive and to digital government.

KEEP Objectives

The KEEP System will:

- be built on national and international standards for trustworthy digital repositories, including Open Archival Information System (ISO 14721:2003) and other relevant standards;
- be designed and built with open source tools as feasible;
- house authentic electronic records in a variety of formats;
- capture those records as close to the moment of creation as possible;
- capture as much descriptive, contextual, administrative, and preservation metadata automatically as possible on the records, and reliably link that metadata to the records;
- provide for future migration of the records to provide preservation and access over time, including migration of file formats;
- maintain the records in a secure environment;
- provide access to authorized users, with the ability to redact or restrict access based on statute or regulation;
- provide a method for the State Archivist to certify the authenticity of the records in the system;
- support the development of fee-based funding sources to maintain the KEEP System and preserve authentic electronic records according to statutory retention periods ;
- improve the efficiency and cost effectiveness of public access to authentic government records by implementing an enterprise-wide archives system;
- interface with INK portal web applications and payment/deposit/reporting subsystems.

KLISS to KEEP Connector

KLISS is the Kansas Legislative Information Systems and Services. It automates much of the work of the Kansas legislative and incorporates it into a coordinated system. It became operational for the 2011 legislative session. With funding from the National Digital Information and Infrastructure and Preservation Program (Library of Congress) through the Minnesota Historical Society's Model Technological and Social Architecture for the Preservation of State Government Digital Information, a KLISS to KEEP connector will be built. This KLISS-to-KEEP connector will facilitate the programmatic ingest of Kansas legislative records with enduring value into a trusted preservation environment.

More specifically, the KEEP system will ingest the data store, known as the legislative "Time Machine". The Time Machine consists not only of the documents of record, but also all the modification transactions that lead to their creation. This creates a complete corpus of data from which it is possible to re-create – edit-by-edit, moment-by-moment – legislative history. Record series contained in the KLISS Time Machine include: bills, amendments, supplemental and fiscal notes, and bill explainers; committee agendas, minutes and reports; journals; calendars; budget analyses; and statutes.

The Time Machine contains three object sets:

1. A series of folders representing revisions that occurred throughout the legislative session. Inside each folder are the files that were changed or added in that revision. In other words, every version of every file is present.
2. A JSON (JavaScript Object Notation) file. This explains the changes that occurred at each revision. It also maps the changes to the specific folder where the version of the file changed exists. You can think of the JSON file as a map between revisions and the documents affected.
3. An SVN (Subversion) binary. This is the information needed to recreate a legislature as it looked at a given point in time. Given the appropriate software or application, the users can specify a time and receive all documents from the legislature as they looked at the given point in time.

Ingesting the Time Machine will require the development of a custom KLISS-to-KEEP connector that will automate the transfer of records from the legislative information system into the trusted digital archives. As a preservation and access safeguard, individual KLISS output files (independent of the Time Machine) also will be transferred to KEEP through the KLISS-to-KEEP connector.

Vendor deliverables for the KLISS-to-KEEP connector task include:
1. A protocol for transforming the KLISS Time Machine content and metadata into a KEEP-ready Submission Information Package (SIP).
2. An automated tool to transform individual KLISS output files and metadata into a KEEP-ready SIP.
3. A web service that transfers the KLISS Time Machine SIPs and individual KLISS output files SIPs to the KEEP ingest zone and proves the chain of custody for all SIPs.
4. A KEEP ingest workflow process designed for the specific needs of the KLISS Time Machine and individual KLISS output files. This includes a virus scan, file type checks, content checks, metadata validation, and chain of custody validation.
5. A transformation of the KLISS Time Machine SIPs and individual KLISS output files SIPs into a Fedora Commons Archival Information Package (AIP).
6. Special handling of storage on the EMC Centera storage system.
7. A service that makes the KLISS Time Machine content and individual KLISS output files available on the KEEP access portal. Access versions of the KLISS Time Machine and individual KLISS output files will be placed in cached storage for fast retrieval.
8. Instructions for setting up a local SVN repository that can read the Time Machine's SVN binary. Propylon will perform a proof of concept with these instructions, proving that they can be executed.
9. Documentation and training manuals for the entire process including instructions for potential use of the KLISS Time Machine.

Appendix F: Center for Archival Resources On Legislatures (CAROL) site map

CAROL Home Page: http://www.mnhs.org/preserve/records/legislativerecords/carol/index.htm

Foundations: Home Page

- Understanding Your Records and Responsibilities
  - Legislative Record Description
  - Record Inventory and Appraisal
  - Record Retention and Disposition
  - Legal Requirements
- Methods of Content Acquisition
  - BagIt
  - Web Harvesting
- Formats and Standards
  - Format Registries
  - Digital Files
  - Metadata Standards
  - XML
  - Web Standards
- White Papers
  - Digital Audio and Video
  - Metadata
  - Legislative Metadata Set and XML Wrapper
  - Open Government / Web Standards
  - Retrospective Digitization
  - Exploring XML

Access: Home Page

- The Basics
  - Foundations Home Page
- White Papers
  - Accessibility
  - Business Case for Digital Preservation
  - Retrospective Digitization
  - Digital Audio and Video
  - Web Archiving and Evaluation
  - Legislative History Resources
  - Legislative Metadata Comparison
  - Use and Reuse of Open Government Data
  - XML
- Projects and Tools
  - ADA Accessibility

    - Legislative Metadata Set and XML Wrapper
    - Native XML Databases and Pilot Project
    - Web Archiving
    - Open Data
    - Projects with the Sunlight Foundation

Preservation: Home Page

- Why Preserve
    - Authentication Home Page
- Accessing Your Needs
- Exploring the Options
- Components of Preservation
- Developing a Preservation Plan
- Choosing a Preservation System
- Preservation Models
- Cost Models
- Preservation System Tests
- White Papers
    - Business Case of Digital Preservation
    - Cloud Computing
    - Needs Assessment
    - Exploring Preservation Options
    - Factors to Consider when Choosing a Preservation System
    - Preservation Plan
    - Preservation Models

Authentication: Home Page

- Uniform Electronic Legal Materials Act (UELMA)
- White Papers
    - Authentication of Primary Legal Materials and Pricing Options
    - Authentication Methods
    - Authentication Overview
- Resources
    - Legal Framework of States
    - Specific Acts and Rules
    - Perspective from Legal Communities