Electronic Records Research Report

Prepared for the
Records Management Interagency Coordinating Council

By the
Electronic Records Research Committee

November 1, 1998
Austin, Texas

Electronic Records Research Report

Prepared for the
Records Management Interagency Coordinating Council

By the
Electronic Records Research Committee

November 1, 1998
Austin, Texas

Acknowledgments

The Electronic Records Research Committee would like to thank the following for extending their time and expertise to this project.

Mary Ann Albin, Texas State Library and Archives Commission
Anne Blanton, Office of the Comptroller of Public Accounts
Dr. Eugenia Brumm, Texas Natural Resource Conservation Commission
Scott Burford, Department of Transportation
Rex Evans, General Services Commission
Gayle Fischer, Texas Workforce Commission
Kay Ghahremani, Health and Human Services Commission
Eric Hahn, student, University of Texas at Austin Graduate School of Library and Information Science
Sherry Lyons, The University of Texas Health Science Center at Houston
Patrick McBride, META Group
Steven Meyers, Office of the Attorney General
C. R. Thomas, Department of Human Services
Mary Ann Thyssen, Department of Information Resources
Ysabel Trinidad, University of Texas at San Antonio
Nancy Rainosek, Office of the State Auditor
Donald D. Volz, Southwest Texas State University
Lewis Watkins, University of Texas Systems Office
Mike Wegner, Office of the Comptroller of Public Accounts
Diana Williamson, Department of Human Services
Laura Wisdom, Office of the State Auditor
Dr. Ronald E. Wyllys, University of Texas at Austin Graduate School of Library and Information Science

A special thanks is extended to all members of the Records Management Interagency Coordinating Council.

Teresa Morales, Comptroller of Public Accounts
Dr. Robert Martin, Texas State Library and Archives Commission
Carolyn Purcell, Department of Information Resources
Dan Procter, Secretary of State
Sandra Coaxum, Office of the Attorney General
Hadassah Schloss, General Services Commission
Vandita Mehta-Zachariah, Office of the State Auditor

Electronic Records Research Committee

Martha Richardson, Department of Information Resources, Co-chair
Elizabeth Love, Texas State Library and Archives Commission, Co-chair

Stan Gunn, Texas Youth Commission
Carolyn Foster, Texas Library and Archives Commission
Kim Bradley, State Auditor's Office
Denise Pullen, Texas Department of Human Services
Tim Nolan, Texas State Library and Archives Commission
Paul Gulick, Office of the Governor
Beverly Nickerson, Department of Protective and Regulatory Services
Sara Mitchell, Employees Retirement System
Benny Ridge, Texas Department of Transportation
Tamara Armstrong, Travis County Attorney's Office
Dan Procter, Secretary of State
Jerry Johnson, Department of Information Resources
Bill Grabo, Texas Higher Education Coordinating Board
Mike Corley, University of Texas System Office
David Clawson, University of Texas at Austin
Peg Fischer, Texas Workers' Compensation Commission
Coby Condrey, Texas State Library and Archives Commission
Bill Carlson, Office of Court Administration
Nick Osborn, Department of Information Resources

Copies of this publication have been deposited with the Texas State Library in compliance with the State Depository Law.

This report is available on-line at http://www.tyc.state.tx.us/errc.

Contents

Fiscal Impact Summary

General fiscal impact information is discussed regarding each recommendation in this report. Specific fiscal impact statements will be developed when the recommendations are implemented.

Overall, agencies will need to take into consideration the importance of maintaining documents and records in electronic format for retention and archival requirements and public access as they develop their Legislative Appropriations Requests.

Appendix 1, *Factors in Determining Cost Effectiveness of Electronic Records,* discusses benefits and problems created by electronic records, key factors in planning electronic records management programs, and associated cost factors.

Introduction

The 75th Legislature required the Records Management Interagency Coordinating Council (RMICC) to form a research group to study the challenges introduced by digital formats to the management of state records and to public access to state government information.[1] The research group's charge is to study:

- The functional requirements for keeping and archiving records in an electronic format
- Possible cost-effective guidelines for using records in an electronic format
- A possible policy for state government's archiving of records in an electronic format
- Possible standards and policies for formatting information in an electronic format
- Feasible ways to develop a searchable database that contains state agency documents in an electronic format.

In September 1997, RMICC established the Electronic Records Research Committee (ERRC) to conduct research into the five charges given above. Co-chairs were named from the Department of Information Resources and the Texas State Library and Archives Commission. Four focus groups were formed to look at the issues. The focus groups, chaired by ERRC members, held semi-monthly meetings and reported findings to the main committee at monthly meetings. An electronic mail list and a Web site were established to foster communication among the members.

After researching and discussing the issues, the ERRC decided to present its findings and make its recommendations in three broad categories that encompass the five charges presented by the Legislature. Recommendations are presented for managing records in electronic formats, adopting functional requirements for managing records in electronic formats, and making agency information available to the public in electronic formats. Each area involves standards and policies along with cost-effective guidelines.

In the early 1940s, the proliferation of paper created a need for an increasing number of file cabinets. Records management policies were established to contain the unnecessary expense of keeping everything indefinitely and to protect the longevity of information with enduring value for legal, historical, or research purposes. The same situation is recurring now with electronic records. More and larger electronic storage units are purchased to handle data that may or may not have continuing value for government business. Lack of appropriate classification schemes for electronic data allows valuable records to be lost and useless records to be kept. Typical IT (Information Technology) management practices regain storage space by deleting files that have not been accessed for some specified time period, without regard to the value or indispensability of the information contained within the file. Retention

periods should be set for state records in all records media—including electronic formats—based on the government business functions identified in agencies' and universities' retention schedules.

The ERRC's recommendations enable better coordination among records management, archives, and information systems staff within agencies to ensure that appropriate measures are taken to manage and provide access to information in electronic formats.

resource managers work together and share responsibility for managing records in electronic formats.

B. The Texas State Library and Archives Commission and the Department of Information Resources should jointly provide training for records management, archives, and information technology staff to ensure adequate knowledge and skill levels to manage records in electronic format.

C. The Texas State Library and Archives Commission should evaluate the need for basic statutory requirements for Records Management Officers similar to those established by the Department of Information Resources for Information Resources Managers.

D. Existing state standards should be enforced through the use of audits, educational outreach, and consultation.

Implications

A. Standards and procedures for management of electronic records are found in the rules of the Texas State Library and Archives Commission.[6] The agency head or designated records management officer is assigned the responsibility to administer a program for the management of records "created, received, maintained, used, or stored on electronic media." Additional rules governing the creation and use of data files, security of electronic records, maintenance of electronic records storage media, retention of electronic records, and destruction of electronic records specify that each state agency must comply with the requirements, but do not indicate who is responsible. The information systems staff controls computer access and maintenance activities for centralized or networked computers. Individual computer users create, move, and delete files at will through their desktop machines. Although the Records Management Officer is held accountable for administering the electronic records management program, he has no control over the medium in which the records are stored. Because of the conflict in authority, the Records Management Officer is impaired in performing his duty. The independence of the desktop user creates even more conflicts.

The Department of Information Resources issues rules on information security standards.[7] The rule states: "Measures shall be taken…to assure the availability, integrity, utility, authenticity, and confidentiality of information." Owners of information resources must specify appropriate controls to safeguard information resources "from unauthorized modification, deletion, or disclosure." But what is unauthorized deletion? Deleting information from a computer system before its required retention period is met would be unauthorized according to the rules of the Texas State Library and Archives Commission. The information security rules focus on protecting assets from disasters, unauthorized users, and inadvertent disclosure. These rules do not mention that the information being protected must meet record retention requirements. The security rules also state that mission-critical data must be identified, backed up regularly, and stored off-site making these requirements nearly identical to the vital records program identified by the

Texas State Library and Archives Commission.

The confusion in authority and responsibility of Records Management Officers and information technology staff often results in poor to non-existent electronic records management. The records management and archival functions are all too often associated with paper-based records only. Working together to adopt rules will clarify the importance of electronic records management to the state. In particular, identifying requirements for managing electronic records in rules promulgated by DIR will emphasize their importance to the state information technology community.

B. Both the Department of Information Resources and the Texas State Library and Archives Commission are required to provide training for Information Resources Managers and Records Management Officers, respectively. With classes developed and offered from a multidisciplinary approach, information technology staffs will better understand records management and archival principles, and records managers and archivists will understand how information systems operate. Merging and revising training about information systems management, traditional records management, and archival records will result in more effective management of electronic records. Qualified staff in all three areas will be increased.

Current legislation requires the Department of Information Resources to provide training and continuing education for Information Resources Managers.[8] In part:

> (a) The department periodically shall analyze the training needs of information resources managers and adjust its initial training and continuing education guidelines based on its analyses …
> (b) The department shall provide mandatory guidelines to state agencies regarding the initial and continuing education requirements needed for information resources managers …
> (c) The department's initial training and continuing education guidelines must require information resources managers to receive training and continuing education in:
> (1) implementing quality assurance programs;
> (2) training the people who use the agency's information resources and information resources technologies; and
> (3) balancing the technical aspects of information resources and information resources technologies with the agency's business needs…
> (e) The department may provide educational materials and seminars for state agencies and information resources managers.

The equivalent legislation for the Texas State Library and Archives Commission[9] reads:

> (c) Under the direction of the director and librarian, the state records administrator shall:
> (1) provide training, consultative services, and informational material to agency heads, records management officers, and other staff to assist them in

establishing and administering records management programs in each state agency as required under Section 441.183.

C. Establishing basic statutory requirements for Records Management Officers will provide a better opportunity for developing an effective working relationship with Information Resources Managers to resolve the many complex issues related to electronic recordkeeping.

The Department of Information Resources establishes the position of the Information Resources Manager within each agency.[10] The legislation reads, in part:

> Each state agency shall provide that its information resources manager is part of the agency's executive management and reports directly to a person with a title functionally equivalent to executive director or deputy executive director.

Educational and training requirements specified by rule further define the position of the Information Resources Manager:[11]

(a) (1) The head of each state agency is ultimately responsible for the management of state information resources.
(2) The head of a state agency may serve as the agency's information resources manager or may designate another senior agency official to serve as the agency's information resources manager in his behalf….
(4) The head of each state agency shall designate an information resources manager. The state agency's designation must contain the name, title, authority, responsibilities, organizational resources, and education and experience of the proposed information resources manager in the format prescribed by the department….

(b) Initial qualifications and continuing education.
(1) Any person who is appointed the information resources manager of a state agency before September 1, 1992 is exempt from the requirements of the department regarding initial education needed for that position.
(2) Any person who is designated by the head of a state agency as the information resources manager of that agency on or after September 1, 1992 must be a senior official of the agency. Agency heads are encouraged, but not required, to make designations on the basis of qualification guidelines provided by the department. After September 1, 1992, information resources managers for agencies should, as a minimum, possess a four-year college or university degree from a fully accredited institution.
(3) Each designated agency information resources manager shall be required to complete continuing education requirements approved by the board of the department and provided by the department.
(4) The department will provide continuing education programs, including educational materials and seminars, to assure that agency information resources managers remain current in the field of information resources management.

The requirements for the Records Management Officer[12] simply state that:

(a) Each state agency head shall act as or appoint a records management officer for the state agency to administer the agency's records management program.

Instead of identifying educational and training requirements, the statutes specify duties:

(b) The records management officer for each state agency shall:
(1) administer the records management program established under Section 441.183;
(2) assist the agency head in fulfilling all of the agency head's duties under this subchapter and rules adopted under this subchapter;
(3) disseminate to employees of the agency information concerning state laws, administrative rules, and agency policies and procedures relating to the management of state records; and
(4) fulfill all duties required of records management officers under this subchapter and rules adopted under this subchapter.

A clear disparity exists between the educational requirements and authority granted the Information Resources Manager and the Records Management Officer. The IRM is a senior official within the agency, reports to the equivalent of the executive director or deputy executive director, has budget authority, is required to have a four-year college degree if not in the position before September 1, 1992, and is required to receive continuing education. In contrast, no similar statutory structure is in place to assist Records Management Officers in performing their assigned duties.

Information technology and records management staff can better work together on equal footing if training and educational requirements are commensurate. As more information is created and maintained electronically, records managers will become increasingly knowledgeable about information systems. Working together and combining practices from the two disciplines will result in greater accountability and accessibility of electronic records. Developing a common vocabulary, establishing policies and procedures for all staff to follow, and making sure that all information systems are designed and installed with appropriate retention requirements will ensure the viability of records into the future.

D. Texas State Library and Archives rules state that each agency must submit a retention schedule of agency records for approval and re-certification on a regular basis. Other than this requirement, there is no check on whether agency records management programs have been implemented. An agency may have an approved schedule, but not follow it. An agency may follow an approved schedule for paper records, but not for electronic records. To ensure that agencies are managing and protecting electronic records according to their retention schedule, regular audits should be conducted. The Department of Information Resources requires periodic audits of information system security by each agency. Audits for meeting retention for electronic records might be combined with the security audits. These audits could be conducted by the agency's internal auditor or included in audits of the Office of the State Auditor. Providing an official check on how well an agency is meeting electronic records management requirements

will raise the level of importance of the issue within the agency and identify any problems to be corrected.

In addition, educational outreach programs should be offered by the agency Records Management Officer in conjunction with the Texas State Library and Archives Commission, State and Local Records Management Division. Acceptable electronic records management practices and policies should be included in employee handbooks and included in new employee orientation. These steps will raise employee awareness of their responsibility to manage and protect electronic records in their care.

Fiscal Impact

Because both agencies have rule-making authority and training requirements already in their legislation, establishing joint rules and joint training classes should not incur additional costs. In fact, combining or modifying classes already offered could result in cost savings for TSLAC and DIR.

If the Texas State Library and Archives Commission establishes basic statutory requirements for Records Management Officers similar to those established by the Department of Information Resources for Information Resources Manager, training and salary requirements for agencies RMOs may increase. Training records management and information technology staff in techniques of the others' discipline, will provide agencies better-qualified staff for developing workable electronic management solutions. For individual agencies, training costs will likely increase.

Storage costs for electronic records may be reduced when minimum retention periods are applied. Over the long term, savings can be achieved by agencies by managing electronic records in a more efficient manner.

Recommendation 2

The Texas State Library and Archives Commission should amend its rules for managing electronic records to make these standards applicable to all state records maintained in electronic format.

Although agencies are already legally required to have a records retention schedule that identifies records regardless of format, in practice, approved agency schedules apparently do not include all types of electronic records. Individual employees create records in the normal course of business that may be stored on a mainframe computer, a file server, the hard disk on their desktop computer, or a removable storage medium. Individuals create their own directory structures and file names and delete files they no longer need without regard to the business function or scheduled retention period of the records. They may not even be aware that the documents they are creating or receiving are records.

Many information systems are not designed for recordkeeping purposes. They are developed to support business needs and operate efficiently by minimizing storage needs and deleting obsolete data. Information compiled in these systems may not provide the contextual evidence of a transaction or business activity that is vital to records management.

The proliferation of new technologies is driving an increasing volume of automated government information without providing a means to meet recordkeeping requirements. Agencies have implemented e-mail systems, local and wide area networks, intranets, extranets, geographic information systems, imaging and workflow systems, and document management systems. In addition, agencies have developed a multitude of databases, datamarts, and data warehouses. The Internet and Web-based software provide an interesting challenge by creating a new type of document altogether. These Web-based documents may contain links to other text documents, images, video files, or audio files—none of which remain static.

All agency employees must be made aware that the retention schedule applies to *all* record formats.

To implement this recommendation, the following events should occur:

A. Amend the Texas State Library Electronic Records Standards and Procedures to be applicable to all electronic records, not just to records with archival value or a retention value of ten years or more.

B. Remove the option from the Electronic Records Standards and Procedures that allows a paper copy to be maintained as record copy instead of an electronic copy.

C. Ensure that data and record retention requirements are implemented in all new information systems and networks, developed or acquired.

D. Develop useful tools for electronic recordkeeping when an automated electronic records system is not in place.

E. Place the responsibility for identifying document function on the creator of the record.

Implications

A. The present rules governing electronic records[13] state:

> These sections establish the minimum requirements for the maintenance, use, retention, and storage of:
>
> (1) any electronic record of a state agency whose retention period on the agency's records retention schedule, certified under § 6.4 of this title (relating to Certification of Records Retention Schedules and Amendments), is ten years or more…
>
> (3) any archival electronic record of a state agency.

Amending the rule to include short-term records will bring the rule into alignment with other records management rules adopted by TSLAC. At the time the state electronic rules were originally adopted, the administrative decision was to adopt similar rules for both state and local government records in electronic format. Because the Local Government Records Act only gave the commission authority to adopt electronic records rules for local government records with a retention period of at least ten years, the same restriction was applied to the state electronic records rules.

Government agencies, as well as the Texas State Library and Archives Commission, have now had approximately five years experience applying the rules to long-term electronic records. With the rapid rate of change in hardware and software, standards would be useful for short-term electronic records to ensure accessibility. Because the majority of records in electronic format have a retention period of less than ten years, it is especially important to manage these records in the same way as short-term records in other formats. This will improve the efficiency of recordkeeping and ensure access to public information.

B. The standards and procedures for management of electronic records[14] reads:

> (e) Any electronic recordkeeping system not meeting the provisions of these sections may be utilized for records subject to this section provided the source document, if any, or a paper copy is maintained, or the record is microfilmed in accordance with the specifications in American National Standard for Imaging Media (Film)--Silver-Gelatin Type--Specifications for Stability (ANSI IT9.1-1992).

This procedure indicates that a paper or microfilm copy may be used instead of an electronic copy to meet retention requirements. A federal court ruling in November 1997 overruled the National Archives and Records Administration policy that allowed federal employees to print and then delete electronic records. The judge ruled that electronic records often have unique and valuable features not found in paper printouts of the records. For instance, electronic records can be searched, indexed, and manipulated.

The federal rulings have been issued since the state standards were adopted. The rulings indicate that courts will not necessarily accept a paper printout as a complete record, as the electronic record contains additional information that relates to the context used to interpret the data.

The statute listing legal requirements for electronic state records[15] reads in part:

> (b) Certified output from electronically digitized images or other electronic data compilations created and stored in accordance with the rules of the commission shall be accepted as original state records by any court or administrative agency of this state unless barred by a federal law, regulation, or rule of court.

This requirement allows a paper printout to be used as a record but does not indicate that it replaces the electronic record.

Removing the option to substitute a paper or microfilm copy for an electronic copy will bring the state rules in alignment with the directions set for the federal government. The Texas State Library and Archives Commission should consider a change in state policy that would require the electronic version of state records to be maintained in a searchable format for the retention period of the record series. A more progressive policy should be adopted to close the loophole allowing a hard copy or microfilm copy to be deemed the copy of record.

C. Rules on information security[16] adopted by the Department of Information Resources state in part:

> It is the policy of the State of Texas that:
> (G) Security requirements shall be identified, documented and addressed in all phases of development or acquisition of information resources.

Retention requirements should also be identified, documented, and addressed in all phases of development or acquisition of information resources. The Texas State Library and Archives Commission and the Department of Information Resources should work together to develop guidelines for compliance. In comparison with re-engineering the system to meet legal requirements or accommodate increased storage needs after the system has been developed, it is much less expensive and more efficient to design information systems to meet retention requirements from the beginning. Records Management Officers or staff knowledgeable about electronic records management should be included in initial information systems planning meetings.

D. Not all electronic information systems are recordkeeping systems. For instance, a database may be used to keep current contact information. Data is constantly being changed. The system does not keep records of transactions that use the data (such as addressing an envelope) or historical data to indicate what the database contained on a certain date in the past. Other records would have to be created to document a transaction for evidential purposes. Most electronic mail systems store all e-mail together regardless of subject matter or retention period in a Binary Large Object (BLOB) file. Managing e-mail is particularly difficult because the problem is embedded in the technology. The vendor community will need to address this situation. Electronic mail is an area that needs to be studied more thoroughly. It is addressed in the draft version of *Functional Requirements for Managing Electronic Records* separately. In the meantime, agencies can develop simple automated processes to assist staff to identify and manage electronic records, thus providing an interim method to improve electronic records management.

E. Because the creator of a document is the best identifier of its purpose, placing the responsibility of classifying the document on the creator will produce more effective management of electronic records. It is far more expensive and time consuming for someone unfamiliar with the records to attempt to identify their purpose and retention period at a later date. An automated function for classifying documents and staff training will be necessary to accomplish this task.

Some detractors may claim that overworked staff do not have time to absorb any more duties and have not been trained as records managers. In addition, a program that would not allow documents to be saved without first being classified could place an undue burden on users causing frustration. Rather than spend the time necessary to comply, users might attempt to circumvent the system or select the first choice in order to continue working. It would be the responsibility of records management and information systems staff to make sure the task of classifying documents is simple but mandatory. Industry studies indicate that computer procedures should take no more than 15 seconds of a user's time.

Fiscal Impact

The Texas State Library and Archives Commission already has authority to make and change rules applying to the management of electronic records. There should be no specific costs involved in amending the rules, but agencies will need to budget for the ongoing cost of maintaining records electronically. Requiring agencies to maintain electronic records in searchable form, rather than printing them out could increase electronic storage costs significantly.

Ensuring that retention requirements are implemented in the development or acquisition of new information systems will prevent the enormous costs of re-engineering the systems at a later date. Information obtained from the META Group indicates costs associated with correcting errors in various stages of the application lifecycle:

Application Lifecycle Stage	Correction Costs
Requirements Stage	—
Design Stage	1.5 times fixing the issue in Requirements Stage
Before Coding	1 times fixing the issue in Requirements Stage
Before Testing	10 times fixing the issue in Requirements Stage
Test Stage	60 times fixing the issue in Requirements Stage
In Production	100 times fixing the issue in Requirements Stage

Source: *Principles of Software Engineering Management,* Thomas Gilb[17]

Classifying documents when they are created and filing them accordingly is the most cost-effective way to handle them. They will be easier to retrieve and easier to dispose of at the end of their retention period. Although no specific dollar figures may be assigned to the savings over the years, the cost of having staff unfamiliar with the documents determine their value at some distant time in the future will be avoided.

In *A Cost/Benefit Analysis of the Texas Records Management Program for the Fiscal Years 1988 through 1991,*[18] Dr. Eugenia K. Brumm concluded that state agencies were able to achieve cost savings/avoidance of $70 million by adhering to their retention schedules and by using the storage facilities and records management training offered free-of-charge by the State Records Center. Although this study was based on paper

Library and Archives Commission shall adopt rules establishing standards and procedures for the electronic storage of any local government record data of permanent value, and may adopt rules for electronic records whose retention period is at least ten years on a records retention schedule issued by the commission. By statute, the commission is currently limited to adopting electronic records rules for long-term local government records only.

Implications

Since the majority of local government records maintained electronically have a retention period of less than ten years, the Local Government Records Act places significant restrictions on the rule-making authority of the Texas State Library and Archives Commission. The management of electronic records by local governments would be improved if standards could be established that apply to all electronic records.

This standardization is considered advisable for the same reasons previously discussed for the recommendation that the Texas State Library and Archives Commission should amend its rules for managing state electronic records to make these standards applicable to all state government records maintained in electronic format. For local government records, however, this amendment to the rules can only be implemented if the Local Government Records Act is revised to provide authority for rulemaking to the commission for short-term local government records. The implications discussed for extending administrative rules to include the management of all state electronic records also apply to this recommendation.

Fiscal Impact

It is less time consuming and thereby less expensive to apply records management principles to electronic recordkeeping systems when records are being created, rather than having a person unfamiliar with the records determine their function and appropriate retention period at a later date. Electronic records created in a document management system can be classified automatically without requiring additional staff review. If not classified at creation, however, the management of electronic records becomes a time-consuming process of individual evaluation to determine the document's function and retention requirements. If the organization of records to identify the appropriate disposal date is not established at creation, a conservative estimate calculates that meeting legal requirements for disposition of government records takes five times as long as identification prior to creation.

input from agencies and the public, and publish model guidelines for functional requirements for managing electronic records.

B. The Department of Information Resources and the Texas State Library and Archives Commission should establish partnerships with the information technology vendor community.

Implications

A. Draft functional requirements have been written and, if approved, will be available for implementing. Agencies need not create new methods to achieve accountable recordkeeping systems. Once standards are adopted, independent solutions will be discouraged, as they would further the proliferation of systems that cannot talk to each other. Currently, much information is gathered redundantly because information cannot be readily shared among agencies. Granted, there are other barriers to sharing information (perhaps the most critical barrier is the privacy rights of citizens); still, the problem need not be compounded. Further, some records have uses beyond the immediate needs of the creating agency. Some of these records are of long-term, archival value to the government and its citizens. Records that are created with software and hardware dependencies will be very difficult to access as archives in the future. Adopting functional requirements for electronic recordkeeping will began to address the problem of long-term availability. (See the discussion under Recommendation 2 for more issues regarding long-term availability and usability of electronic records.)

B. Involving information technology vendors in reviewing the proposed functional standards should foster a good working environment for all involved. Information technology vendors will be crucial to the success of electronic recordkeeping in Texas, as they are the parties responsible for developing working systems. That vendors are eager to provide compliant systems is indicated by the rapid increase in the number of vendors' products that currently meet DoD standards. Since the standards were adopted in November 1997, six vendors have been certified . A listing of the certified vendors can be found at http://jitc.fhu.disa.mil/recmgt. More and more agencies are using electronic benefits transfer, electronic commerce, and digital signatures to carry out legislative mandates. More and more electronic records are being generated. The vendor community will need to work with state requirements while developing their products.

Fiscal Impact

A draft version of the functional requirements has been written. If the functional requirements are adopted, agencies will benefit from the standardization. Records, information technology, and purchasing staff will save time by being able to identify compliant vendors quickly.

For long-term (retention of ten years or more) and archival records maintained in electronic format, the Commission has also adopted a rule that outlines three requirements for retention of electronic records: [23]

(a) State agencies must establish policies and procedures to ensure that electronic records and any software, hardware, and/or other documentation, including maintenance documentation, required to retrieve and read the electronic records are retained as long as the approved retention period for the records.
(b) The retention procedures must include provisions for:
    (1) scheduling the disposition of all electronic records, according to statutory requirements, as well as related software, documentation, and indexes; and
    (2) establishing procedures for regular recopying, reformatting, and other necessary maintenance to ensure the retention and usability of electronic records until the expiration of their retention periods.
(c) State records having archival value and scheduled to be preserved at the State Archives must be transferred to the State Archives as the source document, or printed out on alkaline paper for computer generated information, or on microforms that meet the specifications in American National Standard for Imaging Media (Film)-Silver-Gelatin Type-Specifications for Stability (ANSI IT.1-1992).

In order to implement this recommendation, the Records Management Interagency Coordinating Committee should create a representative group of state agencies and other interested parties to study alternatives and make recommendations for the 77th Legislative session in 2001.

Implications

The last provision of the standards and procedures for state electronic records is not based on a philosophical preference for preserving archival records in hard copy or microform. Instead, it is a reflection of the limited resources available for the preservation of state archival records. The archival program of the Commission is not funded at an adequate level, in terms of a sufficient number of properly trained professional archivists, to identify and appraise the quantity of state electronic systems to determine which have long-term or archival value. The problem is complicated further in that, even if such systems are appraised and the electronic records are identified as appropriate for permanent preservation, the State Archives does not have the necessary computer hardware and software to permit transfer of and access to these automated information systems.

One possible solution for making electronic records available for historical and research purposes is for the Legislature to provide the necessary resources so that the State Archives can develop into a central repository for archival electronic records. For example, this model is followed at the national level for the preservation of federal electronic records. Budgetary requests have been made in the past by the Commission to allow implementation of these services; however, the funds have not been appropriated.

Another way for the Commission to accept archival records in electronic form is for the creating state agencies to transfer their hardware and software along with the

records, so the electronic records could be more readily accessed. As the hardware and software become obsolete, the Commission would be responsible for migrating the records to new hardware and software platforms. Although necessitating an increase in technical resources as computer systems have to be updated, this possibly could be implemented more quickly and at a somewhat lower cost than the first option.

The current state records management law[24] also includes a new alternative approach that needs to be carefully considered. As stated:

> (e) agencies choosing to create archival records electronically may be required to provide continuing maintenance and access to the records within the agency but in accordance with the records management law, rules adopted by the Commission, or other terms on which the Director and Librarian and the agency head agree.

Achieving cooperation from agencies in the implementation of this statute will be challenging for the Commission, especially because agencies are likely to view this as placing the burden of long-term maintenance for automated systems on their budgets. Agency administrators may feel that their funding is not adequate to handle an archival function, which they do not consider to be part of their primary mission.

Fiscal Impact

In response to the awareness of the need for more effective management of state electronic records, the Texas State Library and Archives Commission submitted supplemental information regarding exceptional items in the FY1998–FY1999 budget request to add staffing resources for this purpose. The following strategy description and justification was provided in support of this request:

> The increasing use of database management systems by government is changing the way state records are created, maintained, accessed, preserved, and disposed. The integration of archives and records management principles into automated information systems is critical to the effective and efficient operation of government. This Supplemental Request would provide two technical positions with systems and records management skills, one support staff, and operating funds to work collaboratively with automation staff in government offices to ensure electronically created information is identified, retained, and preserved or destroyed in compliance with records retention and access requirements; and that information of long-term and enduring values be created and maintained on today's electronic database management systems will be preserved and accessible as technology platforms change in the future.

The requested funds were approximately $146,500 per fiscal year. This amount is the minimum needed to initiate the appraisal of major electronic systems in state government and to develop a well-informed estimate of ongoing costs required to manage electronic records. Several states have used different options, such as pilot projects and grant applications, for approaching the same types of problems as Texas. An immediate solution is not feasible, but an active evaluation of different methods and costs should be prepared to assist the Legislature during the regular session in 2001. At that point, most of the Year 2000 problems, which must have priority at this

time, will be at some stage of resolution, and the Legislature can focus on these other potentially critical concerns.

The fiscal impact can be expected to vary with each approach. It will not be inconsiderable. But, according to Jeff Rothenberg,[25] "The content and historical value of thousands of records, databases, and personal documents may be irretrievably lost to future generations if we do not take steps to preserve them now." That article was written nearly four years ago. The cost of doing nothing is the loss of government accountability, citizens' rights, and Texas history.

Recommendation 1

The General Services Commission should develop cost models for providing information to the public on-line.

The citizens of Texas are taxed to pay for services provided by government. In order to provide government accountability and guarantee Texas citizens the opportunity to know how tax dollars are spent, the Texas Legislature enacted open records laws. Having already paid for the collection, use, and maintenance of the data, the citizen expects to obtain government information for his/her own use at little or no charge.

In the past, information found within government organizations was almost always paper-based. The Legislature recognized that providing copies of requested information to citizens cost staff time and materials, so the General Services Commission was authorized to develop and publish formulas for determining a fair means to recover the cost of providing information to the public. As other media became prevalent, formulas were developed to recover costs associated with duplicating materials in those formats (including electronic).

Over the last five years, agencies have turned to the Internet as a way to provide services and distribute information. Facts about the agency are published through a collection of linked Web pages available to anyone who has access to the Internet. Using this medium may reduce the number of routine information requests and open records requests received by an agency, reducing staff time spent answering questions and making copies. However, publishing an electronic mail address on the agency Web site may generate more questions than ever before received. The audience is no longer limited to interested Texas citizens, but to anyone with Internet access. Many of the questions received over the Internet have nothing to do with the agency's mission, but staff time is used responding to Web-delivered requests. The benefits gained by delivering information to a large audience may also bring disadvantages.

The Legislature increasingly encourages agencies to undertake public access initiatives. In the last session, the Legislature began to address specific ways to provide information to the public, such as requiring each agency to establish an electronic mail address by September 1, 1998. However, with each budget cycle, agencies are discouraged from seeking additional appropriations for implementing these initiatives. Agencies are caught between supporting mission-critical functions and public access issues. The increased demands become financial burdens.

Because the open records laws make no distinction between requests for data by a private citizen and a commercial establishment, agencies have seen private companies obtain low-cost government data and use it to produce fee-based services, sometimes selling the service back to the agency that produced the original data. The private companies can enhance the government data by providing value-added functionality.

Agencies may also develop complex information systems for manipulating data. Although they are required to provide public access to the data, they should not be

required to provide enhanced electronic delivery systems to commercial users unless fees can be charged to recover a reasonable portion of the cost of developing and maintaining information systems.

In order to implement this recommendation, the following should occur:

A. Cost models for developing recovery mechanisms for unfunded mandates and for providing enhanced access to government information should be investigated.

B. The statewide telecommunications infrastructure should provide cost-effective, centralized network access to all agencies, schools, and universities.

C. The General Services Commission should study the true costs of developing and maintaining Web sites for the distribution of government information.

Implications

A. Over the last thirty years, agencies have invested heavily in automated resources to streamline internal functions and deliver services in a more timely and cost-effective manner. Agencies could be allowed to cover costs of making information available in electronic format by charging for certain types of information. For example, the states of Nebraska, Kansas, Georgia, and Indiana are participating in models developed through partnerships with private industry. The Information Network of Kansas[32] receives no tax dollars to support its operations. Its revenue is based on subscription services to commercially valuable data generated by state and local governments. Recovery costs are sufficient to defray the costs of the infrastructure providing the access.

In Texas, the Public Utility Commission (PUC) developed a means of filing and retrieving PUC documents accessible via the Internet. The program, approved by the Legislature in 1995, allows on-line access to vital information 24 hours a day, 365 days a year. System users, who can make payments using credit cards or Cybercash through a secured transaction system, fund the system. Although the PUC can only charge for access to the program until the development costs are recovered, it serves as a model for future methods of recovering costs for development and maintenance of similar programs.

State law already allows for the recovery of costs incurred through fulfilling open records requests.[33] The Public Information Act states:

> The charge for providing a copy of public information shall be an amount that reasonably includes all costs related to reproducing the public information, including costs of materials, labor, and overhead.

The General Services Commission has the authority to establish standard fees based on actual cost to reproduce data and to publish these fees for state agency use.[34] The fee schedule is periodically reviewed for updating. The applicable section states, in part:

(a) The General Services Commission shall adopt rules for use by each governmental body in determining charges for providing copies of public information under this subchapter. The rules adopted by the General Services Commission shall be used by each governmental body in determining charges for providing copies of public information, except to the extent that other law provides for charges for specific kinds of public information. The charges for providing copies of public information may not be excessive and may not exceed the actual cost of producing the information…

(b) The rules of the General Services Commission shall prescribe the methods for computing the charges for providing copies of public information in paper, electronic, and other kinds of media. The rules shall establish costs for various components of charges for providing copies of public information that shall be used by each governmental body in providing copies of public information.

Placing the responsibility to investigate cost models within the General Services Commission appears consistent with approved legislation.

B. In October 1998, the Telecommunications Planning Group published the *Texas Government Strategic Plan for Telecommunications Services*.[35] The plan describes the framework for establishing a telecommunications infrastructure to support the statewide information infrastructure proposed in *A Vision for the Millennium*, the 1997 State Strategic Plan for Information Resources Management.[36] The TPG's legislative mandate and mission statement says:

The Texas Government Strategic Plan for Telecommunications Services will establish the framework for a state telecommunications network that will effectively and efficiently meet the long-term requirements of state government for voice, video, and computer communications, with the goal of achieving a single, centralized telecommunications network for the state.

Even though most government information currently exists within agencies in electronic form, there is additional cost to disseminating it electronically to the public. Communication links throughout the state must be established and technological issues, such as bandwidth, will have to be addressed. The plan supports centralizing support functions and purchasing services, providing connectivity points, supporting vendor-independent standards, and ensuring interoperability, security, and privacy in order to increase the ability of agencies, large and small, to provide electronic access to citizens. In this plan, the General Services Commission will be the managing agency. Following the guidelines presented in the plan will move Texas toward achieving the goal of delivering state services and information to all citizens.

C. Determining full costs of developing and maintaining Web sites for the purpose of distributing information to the public will allow agencies to plan and budget resources. Agencies must have qualified staff to prepare documents and to provide and manage necessary information resources. They may also need to dedicate staff to respond to requests received over the Internet.

A. The Department of Information Resources, the Texas State Library and Archives Commission, and the Office of the Attorney General should jointly develop rules and guidelines for identifying and protecting information in electronic media that could compromise an individual's privacy.

B. The Texas State Library and Archives Commission should continue developing its standards-based electronic index to all state information and services in order to facilitate document retrieval.

C. The Department of Information Resources and the Texas State Library and Archives Commission should continue to review and develop guidelines for developing and managing Web-based records.

D. State agencies and universities should adhere to the plan outlined in the *Texas Government Strategic Plan for Telecommunications Services*[39] to establish a statewide telecommunications infrastructure.

Implications

A. In order to protect the privacy of citizens within electronic information systems, agencies need to limit informational data collected and develop means to mask information that could identify a specific individual. Agencies with similar missions or client bases may collect duplicate data. It seems reasonable that these agencies should share and use the information collected. Coordinating data sharing among agencies could minimize the chance of inadvertently releasing personal information. A move toward encouraging agencies to share information has been undertaken by the Department of Information Resources.

Agencies are required to submit strategic plans for information resources to the Department every two years. The plans are prepared through guidelines developed by the Department. *How to Prepare the Information Resources Strategic Plan for Fiscal Years 1999-2003*[40] requires agencies to identify agency policy and procedures for sharing data with other agencies or other external entities. It also requires an agency to indicate what other organizations share data within its databases and how the data sharing occurs. Finally, it asks that agencies identify their plans for increased sharing of data with other state agencies and to document any obstacles which prevent increased sharing. This provides an excellent starting point to determine what information is currently shared and what information could be shared among agencies for greater efficiency.

Data, whether shared or not, must be protected from unauthorized use. Information placed on the Internet is particularly vulnerable and may put agencies at risk of exposing not only data that should be private, but also data that is mission-critical. DIR's information security standards[41] provide rules to ensure that access to information resources is secured.

(9) Information Safeguards.
(A) Access.

Access shall be managed to ensure authorized use of information resources. Security risk assessment shall be the basis of decisions and policies regarding managed access to information resources.

(B) Confidentiality of data and systems.
  (i) Confidential information shall be accessible only to authorized users. Information containing any confidential data shall be identified, documented, and protected in its entirety.
  (ii) Information resources assigned from one agency to another shall be protected in accordance with the conditions imposed by the providing agency.

(C) Identification/Authentication.
  (i) Each user of information resources shall be assigned a unique personal identifier or user identification except for situations where risk analysis demonstrates no need for individual accountability of users. User identification shall be authenticated before the system may grant that user access.
  (ii) A user's access authorization shall be removed or appropriately modified when the user's employment or role status changes.
  (iii) Systems shall contain authentication functions that comply with documented security risk management decisions.
  (iv) Systems which use passwords shall be based on the existing federal standard on password usage.
  (v) For written electronic communications sent to a state agency where the identity of a sender or the contents of a message must be authenticated, the use of digital signatures is also encouraged. Agencies should refer to Texas Government Code, §2054.060, section 201.14 of this title, and guidelines issued by the Department for further information.

Privacy is not specifically protected by law in the State of Texas. Security and privacy are not the same issue and should not be treated the same. The Department of Information Resources, the Texas State Library and Archives Commission, and the Office of the Attorney General may need to work together to develop guidelines that clarify the difference between security and privacy as well as outline means of protecting privacy. According to *The Protection of Personal Information in Intergovernmental Data-Sharing Programs*,[42] "security" is a method for protecting information, while "privacy" is a reason for protecting information.

Posting information that clearly does not contain personal data should be encouraged. *The Senate Interim Committee on Public Information Summary and Recommendations* report,[43] adopted on September 30, 1998, includes the following recommendation:

> The Legislature should amend the statuary charge to the Open Records Steering Committee to determine the appropriate types of information that all governmental bodies should make available to the public on-line and on the Internet.

Rules are already in place for agencies to send print copies of publications and Web site addresses of electronic publications to the Texas State Publications

Depository Program. These guidelines would serve as an initial listing for agencies to post on their Web sites.

B. The Texas State Library and Archives Commission adopted the following rules[44] for guiding state agencies in meeting requirements for making state publications available over the Internet:

§ 3.3 Standard Deposit Requirements for State Publications in All Formats
(d) For state publications available by an Internet connection:
(2) State agencies must meet the following minimum requirements when providing state publications by Internet connection:
(B) Indexing. Indexed state publications will be accessible through indexes which meet current ANSI/NISO (American National Standards Institute/National Information Standards Organization) Z39.50 search and retrieval standards and which adhere to the application profile of the Federal Information Processing Standards Publication 192 or its successor document.

The Z39.50 standard was adopted to facilitate information retrieval across diverse collections of data resources. It is necessary to use a non-proprietary standards-based communications protocol, independent of database and computer environments, for information retrieval. The standard specifies formats and procedures for governing the exchange of messages between the user and the information source. The Z39.50 standard provides a single interface to search a large number of diverse information resources including library catalogs, geospatial data, government information, and biological specimens.

During the last several months, the Texas State Library and Archives Commission has undertaken an initiative to study the implementation and use of Z39.50 in the State of Texas. Although the primary purpose of the group is to enhance resource sharing among libraries by identifying functional requirements to facilitate procurement and implementation of Z39.50 products, the knowledge gained can be put to use in developing integrated access to networked information.

In response to the requirement[45] to "index all state publications that are available in an electronic format and make the index available in an electronic format," the Texas State Library and Archives Commission created the Texas Resource and Information Locator (TRAIL) service. TRAIL is based on the Government Information Locator Service (GILS) and provides a central index to state government information. The interim version of TRAIL locates and displays available state agency information. To advance to the next version, agencies will need to provide specific information (metadata) to identify each electronic publication. A simple, standard method for identifying metadata needs to be devised to ensure the success of this program.

C. The Department of Information Resources has issued the following Standards Review and Recommendation Publications (SRRPUBs) pertaining to Internet use and Web development:

SRRPUB08 Directory and Locator Services
SRRPUB04 Personal Use of E-Mail & Internet Services
SRRPUB10 Personal Naming Convention
SRRPUB11 World Wide Web Design and Coding Guidelines
SRRPUB12 E-Mail and Document Interchange Guidelines
SRRPUB13 Digital Signatures and Certificate Authority Guidelines

Other guidelines will be provided as necessary.

D. The growth of electronic commerce will depend on the communication medium of the World Wide Web. Interoperability is a key for providing information exchange and connectivity statewide. The basic infrastructure must be in place to connect government organizations and citizens throughout the state.

Fiscal Impact

Providing information to the public over the Internet may reduce the number of general information calls and open records requests received by an agency. Staff time spent responding to these requests will be saved. However, responding to the influx of questions received through a Web address will create more work for staff. Staff responding to questions may need to have higher-level skills than staff who located and copied records in the past. This could impact on training costs and staffing levels.

Making more databases accessible may prove to be quite expensive if the databases contain information that must be withheld from public view. If the information systems were not designed initially to protect certain fields, re-engineering costs may be high. (See Section I, Recommendation 2, Fiscal Impact).

Centralizing development and management of the telecommunications infrastructure will save money over time.

B. Texas is fortunate to have both a large technology vendor community and a university community. Three universities in Texas offer major educational programs in records management, archives, and preservation of materials. These are the University of Texas, Texas Woman's University, and the University of North Texas. Developing partnerships with universities and vendors could provide additional expertise as well as student researchers and writers.

C. Texas is fortunate to have world-renowned experts in the fields of records management, archives, and information resources. Some of those experts work for state agencies. Although these individuals were interested, regular job duties prevented them from contributing to the current study. If agencies would make these individuals available by reducing their work responsibilities for the duration of the study, the state would benefit from their years of experience and knowledge.

Fiscal Impact

The Records Management Interagency Coordinating Council estimates funding for the continuation of the Electronic Records Research Committee to be slightly less than $100,000 for a one-year period. Using a model based on funding requests proposed by Dr. R. E. Wyllys at the Graduate School of Library and Information Science at the University of Texas at Austin, the following costs are presented:

Project Needs	Cost
One faculty sponsor at 4 hours/week	$6700
One full-time equivalent student	$24,000
Administrative overhead	$16,300
Publications and administrative assistance	$9,000
Data collection, computers, supplies	$5,000
Non-Austin-based committee members' travel	$10,000
Committee travel to 5 statewide focus meetings	$28,000
Total	**$99,000**

If a pilot project for implementing an electronic records management program is undertaken, additional funds will be required. The amount of funding will depend on the scope of the project. Determining the feasibility and scope of a pilot study can be one of the issues considered by the Records Management Interagency Coordinating Committee's ongoing investigation.

Glossary

agency head – the appointed or elected official who serves by the state constitution, state statute, or action of the governing body of a state agency as the chief executive and administrative officer of a state agency.

archival state record – a state record of enduring value that will be preserved on a continuing basis by the Texas State Library and Archives Commission or another state agency until the state archivist indicates that, based on a reappraisal of the record, it no longer merits further retention.

confidential state record – any state record to which public access is or may be restricted or denied under Chapter 552 or other state or federal law.

database – (A) a collection of digitally stored data records; (B) collection of data elements within records within files that have relationships with other records within other files.

database management system (DBMS) – a set of programs designed to organize, store, and retrieve machine-readable information from a computer-maintained database or data bank.

data file – related numeric, textual, sound, or graphic information that is organized in a strictly prescribed form and format.

depository library – any library that the Director and Librarian or the commission designates as a depository library for state publications.

depository publication – a state publication in any format distributed from or on behalf of the Texas State Library to a depository library.

electronic external storage device – a removable electronic medium used to store and transfer electronic information.

electronic format – a form of recorded information that can be processed by a computer.

electronic media – all media capable of being read by a computer, including computer hard disks, magnetic tapes, optical disks, or similar machine-readable media.

electronic record – any information that is recorded in a form for computer processing and that satisfies the definition of a state record in the Government Code, §441.180(11).

electronic records system – any information system that produces, manipulates, and stores state records by using a computer.

electronic text document – a text-based document, including word-processed documents or electronic mail messages, and other text-based documents created electronically via text editors or optical character recognition. The documents may contain markup language that formats the text and/or creates links to other information.

functional requirements – baseline standards for systems managing electronic records to be used by state agencies in the implementation of their records management programs.

Internet connection – a combination of hardware, software, and telecommunications services that allows a computer to communicate with any other computer on the worldwide network of networks (known as the Internet), and that adheres to the standard protocols listed in RFC 1920 or its current successor document.

metadata – data describing stored data; that is, data describing the structure, data elements, interrelationships, and other characteristics of electronic records.

on-line – information accessible via a computer or terminal, rather than on paper or other medium.

publicly distributed – information provided to persons outside of the agency in print, in other physical media, by an Internet connection, from a limited local area network on agency premises, or at another location on behalf of the agency.

record series – a group of identical or related records that are normally used and/or filed together, and that permit evaluation as a group for retention scheduling purposes.

records management – the application of management techniques to the creation, use, maintenance, retention, preservation, and destruction of state records for the purposes of improving recordkeeping efficiency, ensuring access to public information under Chapter 552, and reducing costs. The term includes:

(A) the development of records retention schedules
(B) the management of filing and information retrieval systems in any media
(C) the adequate protection of records that are vital, archival, or confidential according to accepted archival and records management practices
(D) the economical and space-effective storage of inactive records
(E) control over the creation and distribution of forms, reports, and correspondence

(F) maintenance of public information in a manner that facilitates access by the public under Chapter 552.

records management officer – the person who administers the records management program established in each state agency under Section 441.183.

records retention schedule – a document that lists the state records created and received by the agency and identifies the length of time a record series must be retained in active and inactive storage before its final disposition.

retention period – the amount of time a record series must be retained before destruction or archival preservation.

state agency –

(A) any department, commission, board, office, or other agency in the executive, legislative, or judicial branch of state government created by the constitution or a statute of this state, including an eleemosynary institution
(B) any university system and its components and any institution of higher education as defined by Section 61.003, Education Code—except a public junior college not governed by a university system board
(C) the Texas Municipal Retirement System and the Texas County and District Retirement System
(D) any public nonprofit corporation created by the legislature whose responsibilities and authority are not limited to a geographical area less than that of the state.

state archivist – the person designated by the director and librarian to administer the state archives program under Section 441.181.

state publication – publicly distributed information in any format that is produced by the authority of or at the total or partial expense of a state agency or is required to be distributed under law by the agency. The term does not include information that is solely distributed to contractors with or grantees of the agency, staff persons within the agency or within other government agencies, or members of the public under a request made under the Public Information Act, Government Code, Chapter 552. The term includes but is not limited to, a publication distributed in print, on microform, as audiovisual material, as interactive media or on electronic external storage devices; an on-line publication that is an index to other on-line publications; one or more text, graphic, or other digital files; or a user interface to a computer database.

state publications depository program – a program of the Texas State Library designed to collect, preserve, and distribute state publications, and promote their use by the citizens of Texas and the United States.

state record – any written, photographic, machine-readable, or other recorded information created or received by or on behalf of a state agency or an elected state

official that documents activities in the conduct of state business or use of public resources. The term does not include:

(A) library or museum material made or acquired and maintained solely for reference or exhibition purposes
(B) an extra copy of recorded information maintained only for reference
(C) a stock of publications or blank forms.

state records administrator – the person designated by the director and librarian to administer the state records management program under Section 441.182.

Texas records and information locator service (TRAIL) – a program of the Texas State Library designed to locate, index, and make available state publications in electronic format.

text documents – narrative or tabular documents, such as letters, memoranda, and reports, in loosely prescribed form and format.

uniform resource locator (URL) –the syntax and semantics of formalized information for location and access of resources on the Internet, as specified in RFC 1738 or its current successor document.

Web site – a set of URLs that fall under a single administrative control.

Notes

[1] Act of June 20, 1997, 75th Leg., R.S., ch. 1186, § 4, 1997 Tex. Gen. Laws 4573, 4574.

[2] Tx. Gov't. Code Ann. § 441 (Vernon 1998).

[3] 13 Tex. Admin. Code § 6.

[4] Tx. Gov't. Code Ann. § 2054 (Vernon 1998).

[5] Tx. Gov't. Code Ann. § 552 (Vernon 1998).

[6] 13 Tex. Admin. Code § 6.91–6.98.

[7] 1 Tex. Reg. 5283 (1998) (prop. amend. to 1 Tex. Admin. Code § 201.13(b)).

[8] Tx. Gov't. Code Ann. § 2054.076 (Vernon 1998).

[9] Tx. Gov't. Code Ann. § 441.182 (Vernon 1998).

[10] Tx. Gov't. Code Ann. § 2054.075 (b) (Vernon 1998).

[11] 1 Tex. Admin. Code § 201.3.

[12] Tx. Gov't. Code Ann. § 441.184 (Vernon 1998).

[13] 13 Tex. Admin. Code § 6.92.

[14] 13 Tex. Admin. Code § 6.92(e).

[15] Tx. Gov't. Code Ann. § 441.189 (Vernon 1998).

[16] See Note 7.

[17] Gilb, Thomas. *Principles of Software Engineering Management,* Addison-Wesley Publishing Company (1988).

[18] Brumm, Dr. Eugenia K. *A Cost/Benefit Analysis of the Texas Records Management Program for the Fiscal Years 1988 through 1991*. (Austin, 1992).

[19] Tx. Loc. Gov't. Code Ann. § 201 (Vernon 1998).

[20] See Note 2.

[21] Department of Defense. *Design Criteria Standard for Electronic Records Management Software Applications*. DoD 5015.2-STD. (Washington, D.C., 1997).

[22] Tx. Gov't. Code Ann. § 441.180 (Vernon 1998).

[23] 13 Tex. Admin. Code § 6.97.

[24] Tx. Gov't. Code Ann § 441.186 (Vernon 1998).

[25] Rothenberg, Jeff. "Ensuring the Longevity of Digital Documents," *Scientific American*, January 1995.

[26] State of Texas. Department of Information Resources. *Reaching for the Millennium: Biennial Report on Information Resources Management,* Austin 1998.

[27] Tx. Gov't. Code Ann. § 531.013 (Vernon 1998).

[28] Health and Human Services Commission. *Electronic Availability of Technical Assistance*. Austin, 1998.

[29] 13 Tex. Admin. Code § 3.

[30] Charles R. McClure and J.Timothy Sprehe. *Analysis and Development of Model Quality Guidelines for Electronic Records Management on State and Federal Web Sites*. The National Historical Publications and Records Commission. Washington, D.C., 1998. http://istweb.syr.edu/~mcclure/nhprc/nhprc_title.html (28 Oct 1998).

[31] State of Texas. Telecommunications Planning Group. *Texas Government Strategic Plan for Telecommunications Services,* Austin, 1998. http://www.dir.state.tx.us/TPG/plan-pt1.htm (18 Oct 1998).

[32] U.S. General Services Administration Intergovernmental Advisory Board and Federation of Government Information Processing Councils. *Innovative Funding Approaches for Information Technology Initiatives: Federal, State, and Local Government Experiences*. Washington, D.C., 1998. http://policyworks.gov/org/main/mg/intergov/advisoryframe.html (28 Oct 1998).

[33] Tx. Gov't. Code Ann § 552.261 (Vernon 1998).

[34] Tx. Gov't. Code Ann § 552.262 (Vernon 1998).

[35] See Note 31.

[36] State of Texas. Department of Information Resources. *A Vision for the Millennium: State Strategic Plan for Information Resources Management,* Austin, 1997. http://www.dir.state.tx.us/DIR/ssp97.html (18 Oct 1998).

[37] Health and Human Services Commission. *Electronic Availability of Technical Assistance*. Austin, 1998.

[38] Paulak, E. *Budgeting for Internet/ Intranet Services in 1998*. Stamford, CT: Gartner Group, Gartner Interactive. September 25, 1997.

[39] See Note 31.

[40] State of Texas. Department of Information Resources. *How to Prepare the Information Resources Strategic Plan for Fiscal Years 1999–2003*. Austin, 1998. http://www.dir.state.tx.us/oversight/irsp/instruction.htm (28 Oct 1998)

[41] 1 Tex. Reg. 5283 (1998) (prop. amend. to 1 Tex. Admin. Code § 201.13(b)(9))

[42] Harmon, J. Keith and Rae N. Cogar, *The Protection of Personal Information in Intergovernmental Data-Sharing Programs* (June 30, 1998). http://www.osc.edu/eclips/publications_and_presentations.html#privacy_report (28 Oct 1998).

[43] State of Texas. The Texas Senate. *The Senate Interim Committee on Public Information Summary and Recommendations*. Austin, 1998. http://www.senate.state.tx.us/75r/senate/commit/IC/IC9.htm (28 Oct 1998).

[44] 13 Tex. Admin. Code § 3.3.

[45] Tx. Gov't. Code Ann. § 441.104(7) (Vernon 1998).

[46] Kelly, Kristine L., Alan Kowlowitz, Theresa A. Pardo, and Darryl E.Green. *Models for Action: Practical Approaches to Electronic Records Management and Preservation*. Center for Technology in Government Final Project Report CTG 98-1. Albany, 1998. http://www.ctg.albany.edu/projects/er/ermn.html (28 Oct 1998).

[47] See Note 1.

[48] Tx. Gov't. Code Ann. § 2054.060 (Vernon 1998).

Contents

Executive Summary

Electronic records have significantly improved the old process of storing records on paper. They can be searched, disseminated, manipulated, copied, and used in ways unimaginable thirty years ago. Cost comparisons with the old paper methods are difficult, because it is virtually impossible to estimate the value of increased speed, accuracy, and functionality of electronic records.

Given that the cost of software and hardware changes constantly, each agency faces different solutions to different problems, and as all agencies already have a large investment in automation equipment, this paper does not attempt to make monetary comparisons. Instead, this paper presents a discussion of benefits and problems, lists questions that agencies must answer as they plan electronic records management programs, and identifies specific cost factors. An attached table lists factors while the text discusses these issues in detail. The most important points of this paper follow.

- Electronic records are created and stored by electronic media.

- Electronic records offer many benefits both tangible and intangible. They provide cost savings in space and office supply usage. The ability to include graphs, tables, and images within text documents, to access records faster and more thoroughly, to reduce fraud, to create comprehensive audit trails, and to provide better customer service are all benefits.

- Electronic records also create new problems. Records in electronic form can be destroyed by exposure to magnets and infection by computer viruses. The actual longevity of media used to store electronic records for permanent retention is unknown, whereas some paper records have survived for centuries. Electronic records are unreadable to the naked human eye and therefore dependent on computer hardware and software for access. Both hardware and software become obsolete over time. Data incompatibilities and frequent access may create errors in files. From the management side, data may be kept either far beyond or deleted before normal business retention periods. Historical records in electronic format can be lost completely.

In order to achieve the undeniable benefits and to avoid the pitfalls, an agency must plan to include the following in its electronic records management policies:

- Determine the ability of information systems and staff to manage different record formats.

- Understand the different document formats currently held by the agency, as well as the types that may be added in the future (such as hypertext links, video/audio clips, etc.)

- Investigate the feasibility, appropriateness, and cost of scanning paper records and storing them in an electronic system.

- Study workflow and create a customer service-driven business method that relies on electronic records.

- Understand the need to create controlled vocabularies to retrieve electronic records.

- Ensure that records maintain their integrity throughout their lifetimes, because a minor programming change can alter how a record is retrieved.

- Identify access security for records and determine the need and methods to authenticate and provide physical security.

- Determine the amount of expungement of records an agency may face; expungement is a complicated procedure that varies in occurrence between agencies.

- Study records retention lengths and their effect on agency electronic records, and review the historical nature of agency records.

The specific cost factors are:

- backfile conversion
- scanning
- indexing
- hardware
- software
- storage media
- obsolescence of hardware, software, and media
- maintenance
- scalability — ability to upgrade
- data migration
- media entropy
- bandwidth
- compatibility
- proprietary concerns
- training and staffing
- databank sharing

Public access is another cost factor that is addressed separately.

In today's environment, government work cannot be accomplished without electronic records. With careful planning, agencies can reduce the risks and reap the benefits associated with the use of these technologies.

sometimes microfilmed. Now, a document is created on a magnetic drive and can be read, edited, and stored electronically. Most people still think in terms of paper and often unnecessarily print electronic documents. An agency then must manage paper and electronic records at the same time and thus incur double costs. This situation is beginning to change as staff make the transition from paper to electronic records.

Using electronic media as the sole means of using and creating records has undeniable benefits. Some benefits are tangible. They can be weighed against old methods of doing business with easy comparison of costs. Other benefits are intangible. Computer technology has created new ways to do business that have no comparison to traditional office practices and often outweigh direct costs. Although these intangible costs cannot be compared easily, they do exist and should not be discounted. Many benefits are difficult to compare. For example, how could the cost of faster data sorting be compared when sorting data was not possible by earlier methods? The following section identifies and discusses the type of benefit of similar issues:

- Space can be saved providing an almost incalculable cost savings. Electronic media can store tens of thousands of records in the same space it takes to store dozens of paper records or hundreds of microfilmed records. Electronic equipment is kept on desktops, local area network (LAN) closets, and dedicated computer rooms. This space is much smaller than paper-based records centers, file rooms, and filing cabinets. Benefit type: tangible.

- Supplies and their costs can be reduced. Maintaining records in electronic format reduces the use of paper, printers, and copiers. Staff should be discouraged from routinely printing records. There will be electronic storage expenses, but this cost is plummeting. Benefit type: tangible.

- Information from many parts of an agency or across agency lines can be assembled in seconds. A well-planned electronic records management system or workable policies allow an agency to build complete files that link data together to an identifier (name, case number, etc.). Benefit type: mainly intangible (some one-to-one comparisons can be made with the cost of pulling files, but this is usually a specious comparison because the task would never have been attempted with paper records).

- Fraud can be reduced. Electronic records can be used to verify client identity and information faster and more accurately, check backgrounds more completely, and ameliorate other fraud risks better than paper records. Benefit type: mainly tangible (the rapidity of data collection is comparable, but the amount of data is not cost-comparable).

- Productivity can be increased. Staff can use previous documents as templates and produce new documents with a few keystrokes. Editing, data collation, mathematical manipulations, and other tasks can be completed in less time. Benefit type: mainly tangible (the speed of old and new procedures can be

measured and compared, but some procedures are not easily measured because electronic records must be used to perform them).

- Records can be accessed much faster and more thoroughly. Researchers and other users can read records anywhere in the world at any hour of the day. There is no waiting for file clerks to pull files, no travel to record centers, and no pouring over crumbling paper records in dozens of boxes. Benefit type: mainly intangible (some comparisons could be attempted by reviewing record pulls, travel, and so forth, but convenience is not truly measurable).

- Audit trails can be detailed, accurate, and complete. Auditors or attorneys can tell who accessed documents, when, and what actions were taken. Benefit type: intangible.

- Documents can be produced with better graphs, charts, lay out, and fonts without the aid of graphic designers and artists. Reports can include hypertext links to definitions, sound and video inserts, and supporting material. For some records, these items only provide an improved appearance, but for other documents formatting is critical to understanding the data. Benefit type: intangible.

- Better customer service can be achieved through access to electronic documents. The same document can be accessed faster than paper records and by multiple users simultaneously. Requests for information can be answered without delay. Government information placed on the agency Web site can be accessed directly by citizens. Quick and easy access to information may help customers form a better opinion of interactions with the government. Potentially, these customer service benefits are the greatest of all benefits. Benefit type: intangible.

As new uses for electronic media are discovered, so are problems discovered. These problems may offset both tangible and intangible benefits. Some of the issues can be resolved with well-planned electronic records management systems and policies. However, other problems are created by the nature of the medium and will require more complex solutions. A partial list includes:

- A magnet can destroy an entire library of data if placed too close to the computer tapes.

- While paper records have lasted hundreds of years, a diskette may last ten years, tapes may last twenty years, and CD-ROMs may last thirty years. True longevity is unknown.

- A new form of outlaw writes viruses that can destroy years of information in seconds.

- Data consumers demand that electronic data be placed on Web sites for easy access raising problems of bandwidth, security, and privacy issues.

- Costly machines may become outdated before they are installed.

pulled into one employee "folder." The process of pulling the separate parts together must be seamless and transparent to the user. If the process is difficult, the user will not use the system. If the proper links are not present, the system can be a liability, as it could be impossible to provide an auditor or attorney with a complete file.

- What types of records are on hand? Currently, records mainly consist of word processing documents, spreadsheets, database reports, and similar records. In the near future, electronic records will include new formats. Media such as digital audio clips and digital video conferences can already be added to records (although this is not yet common). Many word processing and other programs allow the user to insert hypertext links into a document. These links could target other documents critical to the original document, but those linked documents can exist on computers anywhere in the world and may not be managed according to state policies. The management system or the policies governing electronic records management will need to preserve the information of those links and/or catalog the information for later retrieval. In the more distant future, entire records may be entirely audio or video (for example, meeting minutes kept as a digital, searchable movie). These formats will stretch the current technology and policies even while they redefine the understanding of a record.

- Is the system's main purpose to store records? If so, alternate methods may be cheaper. Hardware and software, along with their maintenance, are costly. Storing paper records or converting them to microform might be more cost-effective if the agency does not need multiple or instantaneous access to the records. This issue must be decided on the records series level.

- Will the agency use its electronic records to provide a new way of doing business? This question can be answered after an analysis of the current system, workflow, and the desired return. Workflow management through electronic records can lead to superlative customer service and data turnaround times. While better customer service does not show up as a tangible factor in traditional cost/benefit analyses, improved service and access can help citizens understand their government and use its services.

- Will more than one person be entering information into the system? An electronic records management system can capture data about an entire agency's information assets. A controlled vocabulary with naming conventions and a means to capture metadata (such as author, subject, dates, recipient, and so forth) is necessary. This data management is even more critical if the agency does not have a dedicated electronic records management system, but instead relies on staff members and policy to manage the agency's records.

- Can a record maintain its integrity within the changing computer environment over its retention length? Particularly with records stored in relational databases, a minor programming change can destroy the possibility of recovering the same data in the same format that existed at one time. An agency must make plans to

maintain old software, database indexes, runtime files, written guidelines, and so forth over the entire life of the records.

- What level of access security is needed? All agencies have confidential records with various degrees of security levels, such as: 1) records that are open to an extent (for example, the names of law enforcement officers are public information while their addresses and phone numbers are not); 2) completely open records, such as fiscal and most administrative files; 3) completely closed records, such as criminal history reports, certain client case files, and information protected by common law privacy; 4) records that may be withheld at the discretion of an agency and are subject to Attorney General opinions, such as agency policy deliberations, certain criminal investigations, and standard examinations; and 5) records that were once closed but now are open, such as bid documentation, property appraisal documentation, and some closed and adjudicated legal cases. All agencies will have some mix of these security types. The system will need to include security access filters tailored to each group of records throughout their changing life cycles.

- What level of authentication security is needed? Electronic records can easily be changed after their creation, and changes are almost impossible to detect. Date and time data can be crucial in legal proceedings, but cannot now be guaranteed. An electronic records management system must include more secure ways of "locking" records and policy must govern access to certain levels of control. Without these features, the authenticity of all of an agency's electronic records could be questioned.

- How will the physical security of the records be maintained? Records could once be stored under lock and key, but electronic records can be destroyed by a virus, opened by hackers, copied onto extremely small media and smuggled out of an agency for improper use, and so forth.

- How often, if ever, are records ordered for expungement? A judge may order expungement of an entire file, or a small part of a record. The agency must remove the material or make it unreadable (redaction). If the record is stored on write-once media such as CD-ROM, expungement is difficult. To expunge, someone must rewrite all the data on the CD to another CD, but not copy expunged material. The original CD is then destroyed. With rewritable media, there is also the danger of accidentally violating a court order. If an agency expunges the electronic record, but does not exclude this data from a backup action and restores the data, the expunged material will return. An agency would have to ensure it controls all copies of records at all times. If an agency faces frequent expungement, this process and level of control will be costly. However, the stakes are high — if an officer or employee knowingly releases, disseminates, or uses the expunged records or fails to obliterate or returns such records, the person commits a Class B misdemeanor and is subject to criminal penalties. It is also possible for an agency and/or its employees to be civilly liable for this action.

Indexing criteria need to be identified by higher level employees (legal files may need to be indexed by an attorney or a paralegal). Once these employees identify the index, they (or data entry staff) will need to enter the index criteria. Some programs will allow a user to scan a document, keep its image and a text file (usually ASCII), and search it. This process can reduce some indexing needs, but is not a substitute. An electronic records management system should capture certain indexing "metadata" that identify the records. This information capture should be easy to use.

- **Hardware**—The cost will depend on the size and type of the application and of the agency. A minimal system could include computer with read/write drive, monitor, and access to a scanner. Beyond this, the user would add more computers, optical storage systems, servers, connection cables, and so forth. The type of records an agency owns also affects the hardware. If the agency has a great deal of scanned records, each workstation will need a large format monitor (nineteen to twenty inches). The number of records governs the size of servers, storage devices, and so forth. Agencies already have a significant investment in automation equipment, but they will continue to upgrade machines that allow new means of using and managing electronic records. This ongoing need to purchase new equipment to replace scarcely used equipment will continue into the foreseeable future.

- **Software**—Prepackaged software meets many needs but an agency may need its own software tailored to its unique tasks, causing the agency to hire or contract programmers. An agency will need basic application software such as word processing, spreadsheet programs, operating systems, and so forth. The size of the agency will determine costs. The more people on the system, the more licenses the agency will need. The agency may secure a site or enterprise license, but this is not always possible. Software arguably changes faster than hardware, and increases the need to upgrade to more powerful hardware that can run new software.

- **Storage media**—Includes many different means of keeping electronic records — CD-ROM, magneto-optical, tape, and hard drives. Each medium presents different costs, benefits, and problems. The record series will help determine which medium to use. The agency must also look at the cost of storing each record on the medium that will depend on file size. The agency must keep in mind that a one-page scanned document might consist of 100,000 bytes, a formatted word processing file of 24,000 bytes, or an ASCII file of 24,000 bytes, and determine the most cost-effective means to handle that information.

- **Obsolescence**—Arguably the largest cost in managing electronic records. Hardware, software, and media become obsolete faster than most document retention lengths. As a system ages, the agency needs to replace computers, scanners, storage devices, and so forth. New technologies drive other costs as old methods give way to the "next big thing," forcing an agency to convert or become obsolete in providing government services. These obsolescence cycles are rapid and impossible to predict, but an agency's present hardware becomes so much

surplus property when they occur. Also, changing file formats drive other forms of obsolescence; for example, a server that was adequate for some tasks cannot handle a new format and must be replaced. Competition in the computer industry can create another form of obsolescence. A provider may go out of business or be bought by a competitor, thus ending support or the ability to upgrade.

- **Maintenance**—Staff will need to maintain hardware and software or hire contractors to perform this task. Maintenance can include simple cleaning and upkeep of computer equipment, but must also include keeping up with changes and recommending upgrades, installing the upgrades, and other factors.

- **Scalability**—The ability to upgrade hardware or software. As agency needs and duties change or as hardware and software changes, upgrades are necessary. For instance, an agency may need to increase the number of employees on a LAN system, and because of scalability, it will be less expensive to upgrade the existing system than buy a new one. With increased scalability, a package will be less likely to become obsolete.

- **Data migration**—The planned moving of data from an older format to another format, even if no "major" change occurred (see Backfile conversion). Data with long-term retention (more than ten years, or five years for mission-critical data) must be migrated to new formats in order to guarantee users can still use the records. The data migration plan must be part of the electronics records management process. It must account for both small and dramatic changes in software, hardware, and operating systems.

- **Media entropy**—The decay of media, including paper, metal, and magnetic forms. All media decays at a certain rate. Computer media is too new to predict accurately this entropic rate. Data tapes must be rotated to prevent sagging, and old tapes have melted or caught fire in new high-speed drives. Diskettes sometimes fail after a dozen read/write cycles. Some evidence indicates that a small but significant percentage of CD-ROMs and related media can develop read errors after thirty years (cf., National Media Laboratory [NML] report *Life Expectancy of Various Information Storage Media,* at www.nta.org/MediaStability/WhatsNew/USN-WR/disp2040.html and also *Whoops, there goes another CD-ROM,* U.S. News & World Report, 02/16/1998 — NML disputes some conclusions in this article). Because of entropy, records with long retention lengths must be migrated to new media even if there are no software or hardware changes.

- **Bandwidth**—Refers to the amount of data a system can pass to its components. Imagine a hose carrying water; the larger the hose diameter, the more water it can handle at a faster speed. The number of internal users using records and the size of those records are constantly growing. People outside an agency are also entitled to access government records. As these demands increase, the agency will need to purchase/lease additional fiber optics bandwidth and replace application servers, cables, other hardware, and the controlling software.

- **Compatibility**—Covers a wide range of concerns. An agency is a large workgroup within the larger workgroup of state government, which in turn is responsive to the state's people. Workers in federal government and in other states also interact with an agency. The agency must share information within itself and with all these and other stakeholders. Currently, agencies use paper reports that are readable by everyone, but cannot be searched, sorted, or indexed like electronic reports. They also cannot be shared and distributed in the same way as electronic reports. For this reason, more stakeholders are demanding access to electronic records that must be read on compatible machines in a compatible format or converted to a format that all can read. Until recently, users could share an ASCII file containing the written information without certain formatting features such as bold text. Now, some formatting data is critical to the use of the document. State government, as a whole, needs to adopt standard software and hardware configurations. Unfortunately, this could lead to some agencies having to upgrade software faster than otherwise necessary for their own business needs. Within agencies, conversions to new software would have to completed concurrently, rather than having certain levels of employees receive new software and filter it to other levels at a later date.

- **Proprietary concerns**—Vendors create applications to perform tasks. The applications are sold to agencies and supported by the vendor. If a vendor is purchased by a competitor or goes out of business, support for the product and future upgrades to the system could disappear. The agency may face costly changeovers to another vendor. Competitors in the software and hardware industries may also develop their own standards that are not compatible with other standards, which leads to even further compatibility problems.

- **Training and Staffing**—Staff assignments and training will be critical. Software and hardware changes rapidly and employees are and will continue to be hard-pressed to keep up with the changes. Along with software/hardware changes, staff will need to be trained in electronic records management procedures. Agencies also provide staff for computer maintenance, LAN administration, network setup, and other technological tasks that did not exist fifteen to twenty years ago. Agencies must continue to provide these services or outsource. As we convert to solely electronic records, agencies will need to provide people knowledgeable about their program areas to create and maintain databases, select identifying "metadata," help create and maintain search engines, and manage Web sites. Specialized MIS departments or contractors have provided some of these services, but there will be a growing need for program staff to understand the new medium and work with MIS experts, as the presentation can determine the content of the information within the records.

- **Databank sharing**—A databank is the use of a large computer to operate several smaller linked LAN systems. A databank would house most of the files an agency creates. Sharing a databank could enable smaller agencies to use equipment and human resources to which they might not have access and reduce obsolescence times.

changes the value of an electronic record. A recent court case (Public Citizen, et al., v. John Carlin in his official capacity as Archivist of the United States, et al.) ordered federal electronic records to be maintained in their electronic form.

Increasingly, electronic media are being recognized as a new way in which to store records. The medium requires new or revised management procedures and new ways of dealing with and thinking about records. Without this new functionality, government cannot adequately serve its citizens, protect its information assets, or preserve historical records. Agencies will now need to create procedures and policies that ensure the management and protection of records throughout their lifetimes. The challenges of media entropy, obsolescence of machines that read records, and new generations of software that cannot read older versions must be faced. At the same time, government can use the new technologies to become more accessible to the people it serves, provide better customer service, and create new ways of doing business.

Cost Factors

Hardware	Software	Backups
Actual costs: Viewing device (monitor, CRT, and so forth) — size and color Disk storage and controller Computer — size, speed, and type Communication access connection (LAN/WAN, Internet/intranet, and so forth) Servers Storage, mass storage devices Imaging — scanner, OCR, read-only Better bandwidth Controller cards Hidden costs: Training (down-time, learning curve) Upgrades Obsolescence (data migration) Maintenance (hidden cost — emergency and actual cost — planned)	Actual costs: Operating system Internet connection software Access — who gets in? at what level? Software security Authentication Expungement Telecommunication — firewall and Web software Application — which ones? Compatible with previous records? Imaging Metadata Records management system software Hidden costs: same as hardware and proprietary issues Database Maintenance (hidden cost — emergency and actual cost — planned)	Minimum — weekly backup of entire system (prefer nightly) Storage media Hardware and software Off-site storage Disaster recovery planning Hidden: level needed Migration of backup media Rotation of tapes Destroy media if expunged records — CD-ROM not rewriteable
Conversion	**Environmental**	**Personnel**
Legacy systems — hardware Backfile conversion — how far back? which records? Hidden: complete set of records, study each record series to determine if they stand by themselves or need history — still link if not converted?	Floor space — server rooms/telecom rooms Power and climate control Perhaps: mainframes Hidden: utilities and additional staff space	Trainers Maintenance Web site manager Database experts Search engine creators

Contents

Foreword

The Functional Requirements Workgroup wishes to acknowledge that the basis for our work was the *Design Criteria Standard for Electronic Records Management Software Applications* of the Department of Defense (approved November, 1997 for mandatory use by all Department of Defense components and also known as DoD 5015.2 - STD). Our research shows that the functional requirements for recordkeeping are basically agreed upon and based on work at the University of Pittsburgh (The Pittsburgh Project) as well as work at the University of British Columbia (whose staff worked with the Department of Defense). The DoD requirements address those functional requirements fully. The DoD requirements have the additional benefit of being stated in concrete (versus theoretical) terms. Software vendors will create off-the-shelf records management software for certification by the DoD in order to supply the demand from DoD's various components. (As of this writing, August 21, 1998, six commercial off-the-shelf systems have been certified.) The DoD requirements are the product of research and consultation among records managers, archivists, academicians, and information and systems professionals. They are, as well, realistic and realizable. The Workgroup believes that we have successfully adapted the DoD requirements to Texas.

A word of caution. Words or terms defined in the Definitions section are highlighted in bold face type the first time they appear in the text of this document. Readers are urged to check the definitions, especially when usage is known to vary among professions. For instance, the modifier "archival" used in this document has little to do with "archiving" used as a verb by information technology and information systems professionals to describe backups of data or off-line storage of non-current data.

In this document, the word **"shall"** identifies mandatory system standards. The word **"should"** identifies design objectives that are desirable, but not mandatory.

2. Systems managing electronic records shall assign a unique computer-generated **record identifier** to each record they manage regardless of where the record is stored.

3. Systems managing electronic records shall prevent subsequent changes to documents that have been designated as records. The format and content of the record, once filed, shall be preserved. Changed or revised records shall be designated as new records with different identification data.

4. Systems managing electronic records shall not permit modification of the record identifier once assigned**.**

5. Systems managing electronic records shall for all records capture or provide the user with the capability to assign, as appropriate, the following **metadata** when the record is filed:

    a. Subject
    b. Date Filed
    c. Addressee(s)
    d. Format
    e. Location of Record
    f. Document Creation Date
    g. Author or Originator
    h. Originating Organization

6. Systems managing electronic records shall provide the user with the capability to edit the metadata listed above in paragraph 5 prior to filing the record except for data captured electronically from e-mail or other automated systems.

7. Systems managing electronic records shall provide the capability for only custodians of information resources to add user defined metadata fields, for site-specific information such as project number, etc.

8. Systems managing electronic records shall provide the capability to output for viewing, saving, and printing the record metadata identified in paragraph 5 above.

9. Systems managing electronic records shall provide the capability for only custodians of information resources to limit the record series item numbers and agency item numbers available to a user or work group. The electronic records management system shall ensure that only current and valid record series item numbers and agency item numbers are presented to the user for selection during filing.

10. Systems managing electronic records shall allow a record to be assigned to more than one series when appropriate.

records, record profiles, and other records management information due to system failure, operator error, disaster, or willful destruction.

3. **Recovery/Rollback Capability.** Following any system failure, the backup and recovery procedures provided by the system shall provide the capability to complete updates (records, record profiles, and any other information required to access the records) to systems managing electronic records, ensure that these updates are reflected in system files, and ensure that any partial updates to system files are backed out. Also, any user whose updates are incompletely recovered, shall, upon next use of the application, be notified that a recovery has been executed. Systems managing electronic records shall also provide the option to continue processing using all in-progress data not reflected in system files

4. **Deletion of Backup Copies.** The system ensures that backup copies are stored no longer than the original retention period of the record series.

5. **Rebuild Capability.** The system shall provide the capability to rebuild forward from any backup copy, using the backup copy and all subsequent **audit trail**s. This capability is typically used to recover from storage media contamination or failures.

6. **Storage Availability and Monitoring.** The system shall provide for the monitoring of available storage space. The storage statistics shall provide a detailed accounting of the amount of storage consumed by electronic records management system processes, data, and records. The system shall notify only custodians of information resources of the need for corrective action in the event of critically low storage space.

XVI. Additional Baseline Requirements

The following are records management requirements that shall be implemented by the organization, but not necessarily by the systems managing electronic records:

1. **Electronic Calendars and Task Lists.** Some electronic systems provide calendars and task lists for users. These may be state records. Calendars and task lists that meet the definition of records are to be managed as any other record.

2. **External E-mail.** Some agencies use separate e-mail systems for Internet e-mail or other wide area network e-mail. These records shall be handled as any other records.

3. **Ability to Read and Process Records.** Since systems managing electronic records are prohibited (Section 7, paragraph 2) from altering the format of stored records, the organization shall ensure that it has the ability to view, copy, print, and if appropriate, process any record stored in systems managing electronic records for as long as that record must be retained. The organization may meet this requirement by maintaining the hardware and/or software used to create or

capture the record; by maintaining hardware and/or software capable of viewing the record in its native format; by ensuring compatibility with earlier hardware and software configurations when hardware and/or software is updated, or by migrating the record to a new format before the old format becomes obsolete. Any migration shall be controlled to ensure continued reliability and accessibility of the record.

4. **Confidential and Other Sensitive Records.** As required, the agency shall specify requirements and/or acquire additional capabilities for the management of records containing information that is **confidential** under provisions of the Public Information Act including those regarding personal privacy; and any other records confidential by other specific statutes. The agency shall implement special procedures to comply with legal and regulatory requirements for those records.

Definitions

Access. The ability or opportunity to gain knowledge of stored information.

Addressee. The name of the organization or individual to whom a record is addressed.

Agency Item Number. A code or number assigned by an agency to assist in record series control. It is an element found on the agency's records retention schedule.

Archival Code. A code used on a records retention schedule with three possible values. "A" means that the record series carrying that code is an Archival State Record. "R" means that the record series is potentially an Archival State Record, however any record series with that code must be reviewed by the State Archivist. "E" means that a record series normally coded "R" has been appraised by the State Archivist and found to lack sufficient value to merit transfer and retention in the State Archives.

Archival State Record. A state record of enduring value that will be preserved on a continuing basis by the Texas State Library and Archives Commission or another state agency until the state archivist indicates that based on a reappraisal of the record it no longer merits further retention. (V.T.C.A., Government Code, Section 441.180(2)) See also State Record.

Attachment. A document is associated with another document as an attachment when it is attached to the other document and filed in an electric records management system or transmitted between two persons. Both documents are required to form the record in an electronic records management system.

Audit Trail. An electronic means of auditing the interactions with records within an electronic system so that any access to the system can be documented as it occurs for identifying unauthorized actions in relation to the records, e.g., modification, deletion, or addition.

Authenticity. A condition that proves that a record is authentic and/or genuine based on its mode (i.e., method by which a record is communicated over space or time), form (i.e., format and/or media that a record has when it is received), state of transmission (i.e., the primitiveness, completeness, and effectiveness of a record when it is initially set aside after being made or received), and manner of preservation and custody.

Author or Originator. The author of a document is the physical person or the office and/or position responsible for the creation or issuance of the document. The author is usually indicated by the letterhead and/or signature. For electronic records management system purposes, the author and/or originator may be a personal name, official title, office symbol, or code.

Boolean Logic. Logic derived from Boolean algebra. Boolean logic is the basis of modern digital computing, in which the opening and closing of electronic switches represent the truth values 1 (true) and 0 (false) and the functions AND, OR, and NOT.

Confidential State Record. Any state record to which public access is or may be restricted or denied under Chapter 552 or other state or federal law. (V.T.C.A., Government Code, Section 441.180(4))

Copy. In electronic records, the action or result of reading data from a source (electronic records management system repository), leaving the source data unchanged, and writing the same data elsewhere on a medium that may differ from the source (user workspace or other device).

Custodian of Information Resources. A person responsible for implementing owner-defined controls and access to an information resource as defined in TAC 201.13 (b) (1 Texas Administrative Code, Section 201).

Cutoff. To cut off records in a series means to break, or end, them at regular intervals to permit their disposal or transfer in complete blocks and to permit the establishment of new blocks. Cutoffs are needed before disposition instructions can be applied because retention periods usually begin with the cutoff, not with the creation or receipt, of the records. In other words, the retention period normally does not start until the records have been cutoff. Cutoffs involve ending the old blocks and starting new ones at regular intervals**.**

For records with retention periods of less than 1 year:
Cut off at an interval equal to the retention period. For example, if a record series has a 1-month retention period, cut the block off at the end of each month and then apply the retention period (that is, retain the block 1 more month before destroying.)

For records with retention periods of 1 year or more: Cut off at the end of each fiscal (or calendar) year. For example, if the disposition for a correspondence series is “destroy when 3 years old,” then destroy it 3 years after the annual cutoff.

For records with retention periods based on an event or action: Cut off on the date the event occurs or the action is completed and then apply the retention period. For example, if the disposition for case working papers is “destroy when related case file is closed,” then cut off and destroy the working papers when closing the related series.

For records with retention periods based on a specified time period after an event or action: Place in an inactive block on the date the event occurs or the action is completed and cut off the inactive block at the end of each fiscal (or calendar) year; then apply the retention period. For example, if the disposition for a case file is "destroy 6 years after case is closed," then destroy 6 years after the annual cutoff along with other case files closed during that year.

Cutoff is also called file cutoff or file break.

Cycle. The periodic removal of obsolete copies of vital records and their replacement with copies of current vital records. This may occur daily, weekly, quarterly, annually, or at other designated intervals**.**

Database Management System. Set of programs designed to organize, store, and retrieve machine-readable information from a computer-maintained database or data bank. (13 Texas Administrative Code, Section 6.91)

Date Filed. The date and time that an electronic document was filed in the electronic records management system, and thus, became a record. This date and time will normally be assigned by the computer at the time the record is filed in the electronic records management system.

Delete. The process of permanently removing, erasing, or obliterating recorded information from a medium, especially a magnetic disk or tape, which then may be reused.

Destruction. In records management, the disposal action for the majority of records. The information in the records is rendered unaccessable and unreadable. Methods of destroying records include selling or salvaging the record medium and burning, pulping, shredding, or discarding with other waste materials.

Disposition. Disposition means those actions taken regarding records after they are no longer needed to conduct current business. These action include:

- Transfer of records to agency storage facilities or to the State Records Center.
- Transfer of records from one agency to another.
- Transfer of archival state records to the Texas State Library and Archives Commission.
- Disposal of unscheduled records by means of an approved Request for Authority to Dispose of State Records form. (V.T.C.A., Government Code, Section 441.187(2))
- Destruction of records whose retention is fulfilled.

Document Creation Date. The date and time that the author and/or originator completed the development of and/or signed the document. For electronic documents, this date and time should be established by the author or from the time attribute assigned to the document by the application used to create the document. This is not necessarily the date and/or time that the document was filed in the electronic records management system and thus became a record.

Electronic format. A form of recorded information that can be processed by a computer (13 Texas Administrative Code, Section 3.1). See Format.

Electronic Mail Message. A message created or received on an **electronic mail system** including any attachments which may be transmitted with the message.

Electronic Mail System. A computer application used to create, receive, and transmit messages and other documents. Excluded from this definition are file transfer utilities (software that transmit files between users but does not retain any **transmission data**), data systems used to collect and process data that have been organized into data files or databases on either personal computers or mainframe computers, and word processing documents not transmitted on an e-mail system.

Electronic Record. Any information that is recorded in a form for computer processing and that satisfies the definiton of a state record in the Government Code, Section 441.031 (5) and 441.180 (11). (13 Texas Administrative Code, Section 6.91 and the 1997 amendments to Government Code, Chapter 441, Subchapter L.)

Event Retention. A retention instruction that specifies that a record shall be disposed of after a predictable or specified event. The record is eligible for disposition immediately after a specified event takes place.

Format. For electronic records, the format refers to the computer file format described by a formal or vender standard or specification. See also Electronic Format.

Hold. The suspension or extension of the disposition of scheduled records that cannot be destroyed on schedule because of special circumstances, such as a court order or an investigation that requires a temporary extension of the approved retention period.

Location of Record. A pointer to the location of a record. Examples: an operating system path and filename, the location of a file cabinet, or the location of a magnetic tape rack.

Medium Code. A code on a retention schedule specifying that the record series is paper, microfilm, or electronic media.

Metadata. Data describing stored data; that is, data describing the structure, data elements, interrelationships, and other characteristics of electronic records.

Originating Organization. Official name or code that reflects the office responsible for the creation of a record.

Owner. The person responsible for a business function and for determining controls and access to information resources supporting that business function as defined in TAC 201.13 (b) (1 Texas Administrative Code, Section 201).

Receipt Data. Information in electronic mail systems regarding dates and time of receipt of a message, and/or acknowledgment of receipt or access by addressee(s). It is not the date and time of delivery to the agency. This date is required for documents that are received through electronic mail.

Record Identifier. A value, usually system-generated, that uniquely identifies a particular record.

Record Profile. Information (metadata) about a record that is used by systems managing electronic records to file and retrieve the record. It includes information fields such as Addressee(s), Author or Originator, Originating Organization, Date Filed, Document Creation Date, Subject, Medium Code, Format, Location of Record, Records Series Title, Record Identifier. The data fields may also be used by systems managing electronic records as search criteria. See also Metadata.

Record Series. A group of identical or related records with the same function and the same retention period that is evaluated as a unit for retention scheduling purposes. (13 Texas Administrative Code, Section 6.10)

Records Management. The application of management techniques to the creation, use, maintenance, retention, preservation, and destruction of state records for the purpose of improving the efficiency of recordskeeping, ensuring access to public information under Chapter 552, and reducing costs. (V.T.C.A., Government Code, Section 441.180 (7)) (The law goes on to list six specific records management functions.)

Records Retention Schedule. A document that lists the state records created and received by the agency and identifies the length of time a records series must be retained in active and inactive storage before its final disposition to permanent storage, archival preservation, or destruction.

Repository for Storing Electronic Records. A direct access device on which the electronic records and profiles are stored.

Retention Code. A code expressing an event.

Retention Period. The amount of time a record series must be retained before destruction or archival preservation. (13 Texas Administrative Code, Section 6.10) A retention period is the combination of the Retention Code and Retention Time from the agency's records retention schedule. An additional period of storage for semi-active records may be specified.

Retention Time. A number expressing the time period a record series is retained.

Series. See Record Series.

State Record. Any written, photographic, machine-readable, or other records information created or received by or on behalf of a state agency or an elected state

official that documents activities in the conduct of state business or use of public resources. (V.T.C.A., Government Code, Section 441.180 (11)) See also Archival State Record.

Subject. A principal topic addressed in a record.

System Managing Electronic Records. System used by a state agency to manage its records. Its primary management functions are categorizing and locating records and identifying records that are due for disposition. A system managing electronic records also stores, retrieves, and disposes of the electronic records that are stored in its repository.

Time Retention. A retention instruction that specifies when a record shall be cut off and when the fixed retention period is applied. The retention period does not begin until after the records have been cut off. Example: "Destroy after two years — cut off at the end of the calendar (or fiscal) year; retain for two years; then destroy."

Time-Event Retention. A retention instruction that specifies that a record shall be disposed of after a fixed period of time following a predictable or specified event. Once the specified event has occurred, then the retention period is applied. Example: "Destroy three years after close of case." The record remains unscheduled until after the case is closed — at that time the record is cut off and the retention period (destroy after three years) is applied.

Transfer. The act or process of moving records from one location to another. Transfer actions include:

- Transfer of records to agency storage facilities or the State Records Center.
- Transfer of records from one agency to another.
- Transfer of archival state records to the Texas State Library and Archives Commission.

Transmission Data. Information in electronic mail systems regarding the date and time messages were sent or forwarded by the author. If this data is provided by the electronic mail system, it is required for documents that are transmitted and received via electronic mail.

Vital Code. Usually consisting of a checkmark on a records retention schedule, this code identifies a series as consisting of **vital state record**s.

Vital State Record. Any state record necessary to (A) the resumption or continuation of state agency operations in an emergency or disaster; (B) the re-creation of the legal and financial status of the agency; or (C) the protection and fulfillment of obligations to the people of the state. (V.T.C.A., Government Code, Section 441.180 (13))

Appendices

Appendix I. Electronic Mail

The treatment of records created using electronic mail is no different from the treatment of records created using any other electronic system or application. However, the newness of electronic mail and the casual and ubiquitous use of it requires singling it out to forestall misunderstanding.

Filing Electronic Mail Messages (E-Mail)

1. Systems managing electronic records shall treat **electronic mail message**s and their attachments that have been filed as records as any other record, and they shall be subject to all requirements of this document.

2. Systems managing electronic records shall capture and automatically store the transmission and **receipt data** identified in Table T1. below (if available from the e-mail system) as part of the record profile when an e-mail message is filed as a record. Systems managing electronic records shall not allow editing of these metadata.

3. Systems managing electronic records shall store the attachments to an e-mail record and associate and link the attachment with the e-mail record.

4. Systems managing electronic records shall provide the capability to store distribution lists as required to ensure identification of the sender and recipients of messages that are records.

Table T1. Transmission/Receipt Data

Transmission/Receipt Data	Record Profile Mapping
The e-mail name and address of the sender.	Systems managing electronic records shall automatically enter this data into the Author or Originator data field.
The e-mail name and address of all addressees (or distribution lists).	Systems managing electronic records shall automatically enter this data into the Addressee data field.
The e-mail name and address of all other recipients (or distribution lists).	Systems managing electronic records shall automatically enter this data into the Other Recipients data field.
The date and time that the message was sent.	Systems managing electronic records shall automatically enter this data into the Document Creation Date data field.
The subject of the message.	Systems managing electronic records shall automatically enter this data into the Subject data field.
For messages received, the date and time that the message was received.	Systems managing electronic records shall automatically enter this data into the Document Creation Date data field.

Appendix II. Records Creating Applications

Electronic records can be created by any electronic application. This list should not be considered inclusive. It is offered for illustration.

Word processing applications
Desktop publishing
Text editing applications
Spreadsheet applications
Database Management Systems
Computer-assisted design
Electronic Mail Systems
Workgroup applications
Voice messaging
Video conferencing
Document Management Systems
Imaging Systems

Appendix III. Electronic Records Media

Electronic records are created in many media. This list should not be considered inclusive. It is offered for illustration.

Magnetic media:

Diskettes
Hard drives
Magnetic cartridge
Magnetic tape
Digital audio tape

Optical media:

CD-ROM
COLD
Digital versatile/video disk
WORM disk
Erasable optical disk